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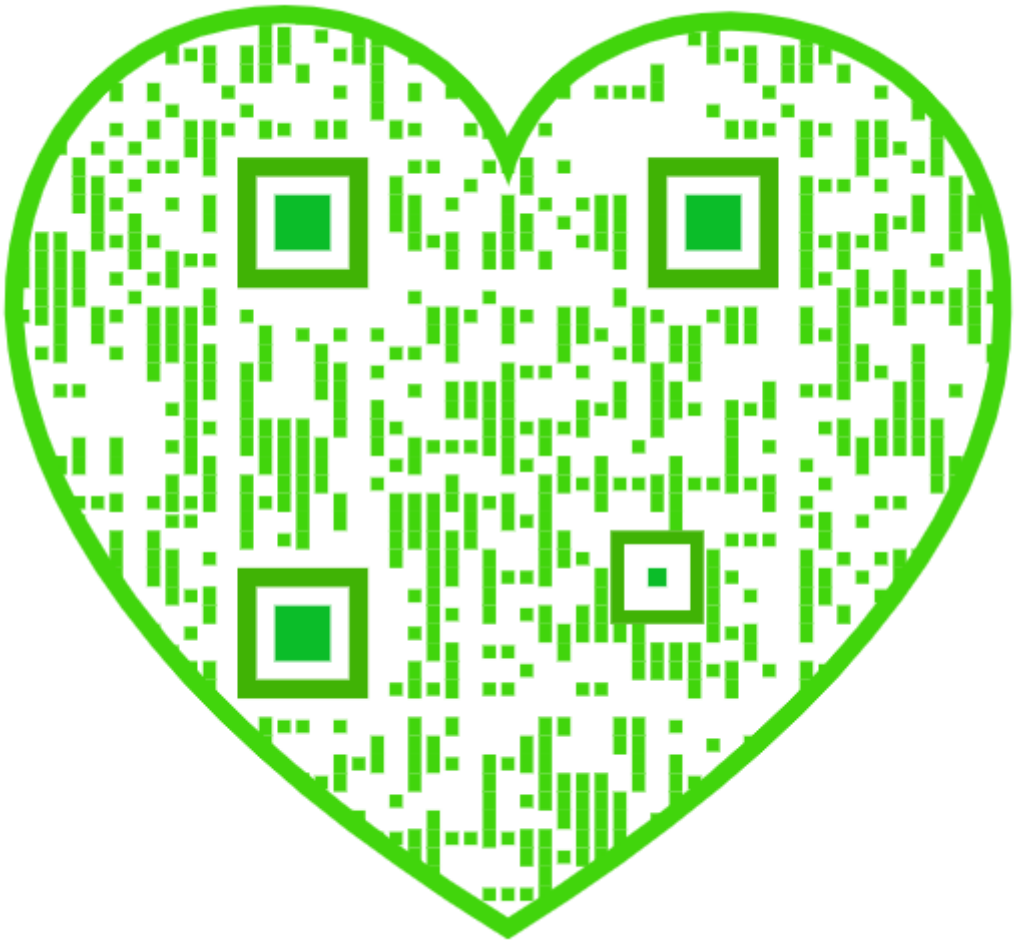

# Scientific American.

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### The Invention of the Magnetic Telegraph.

It is well-known that the English claim the invention of the magnetic telegraph for their countryman, Prof. Wheatstone. The Transatlantic telegraph enterprise has caused the subject of priority of invention in this matter to be much talked of in Europe. The Paris *Moniteur*, the official government paper of France, after thoroughly investigating all the facts bearing upon the case, expresses itself thus:—

"No doubt the discovery of the principles upon which the electric telegraph system is founded does not belong to M. Morse, but he was the first to transfer that discovery from the region of speculative science into that of practical application. It is owing to his labors and to his investigations, the honor of which is incontestibly due to him, that electrical communication, which before his time was but a mere fact asserted by science, has become a reality, and one of the most useful acquisitions which our age has made, and has to bequeath to posterity."

### Improved Corn Husker and Feed Cutter.

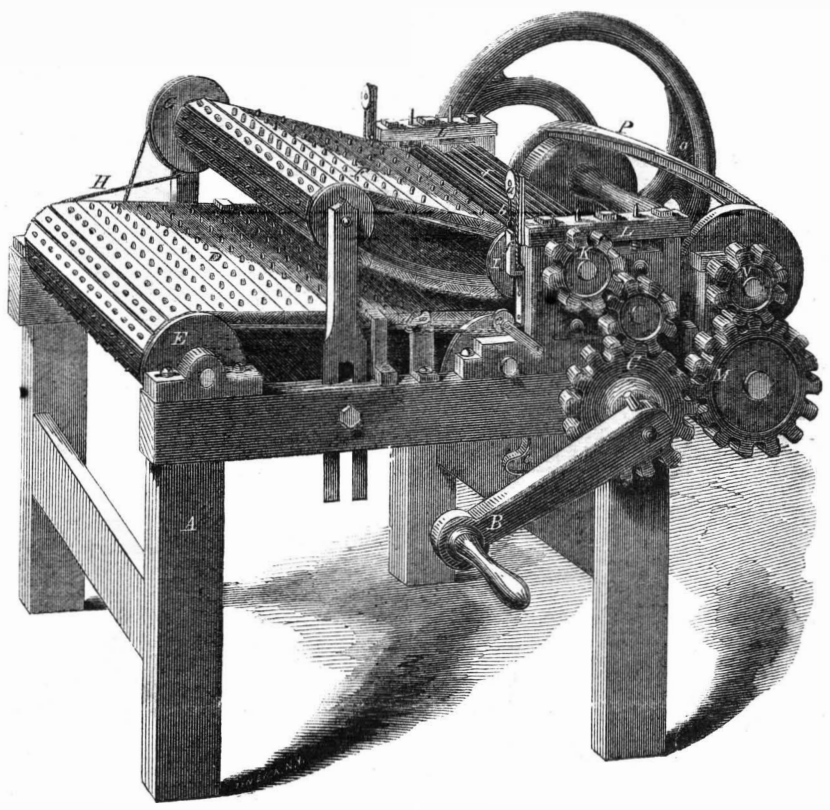
The machine which we illustrate above is one of those combinations of parts in the one frame, for performing two distinct operations, of which we have so often to speak, and which are characteristic of the present era in the history of invention. It is designed for husking corn, and at the same time crushing and cutting the stalk so as to be suitable for fodder. We illustrated the first machine of this inventor—Robert Bryson, of Schenectady, N. Y.—in No. 28, Vol. XII., SCIENTIFIC AMERICAN, and the present one is an improvement in the arrangement and construction of the parts.

A is a frame of sufficient strength to support the machine, but not cumbersome or unweildy. B is a crank handle that rotates the cog wheel, C, and the drums, E, that carry the endless husking band, D; from E there passes a cord, H, which rotates the wheel, G, and so gives motion to the other husking band, F. These husking bands are made by attaching strips of wood provided with teeth, to leather straps or belts, and the lower one, E, has one or two strips removed, so that the corn can drop through into a proper receptacle when it is husked. Some of the strips on E are wider than others, and their different width is made the means of causing the husking device to operate and remain inoperative at the proper intervals, so that when the corn is husked, it shall be free from the teeth, and can be passed away.

The manner in which this is done is simple. The drum, I, which supports the upper husking band, F, moves in a slide, *f*, instead of a fixed journal, and this slide is suspended by a cord, *b*, passing over a wheel, *a*, under a pulley, *c*, and attached to a small lever, *d*. When the broad slats or strips of E are in contact with *d* they cause it to move on its axis, and so lift F out of the way of the corn.

The operation of the machine is simple and efficacious, and a description of it will enable the reader to better understand the remainder of the device. The corn is placed in the device, stalk first, and it is caught by the husking teeth, and carried by them to the crushing rollers, J, which break and crush the stalk.

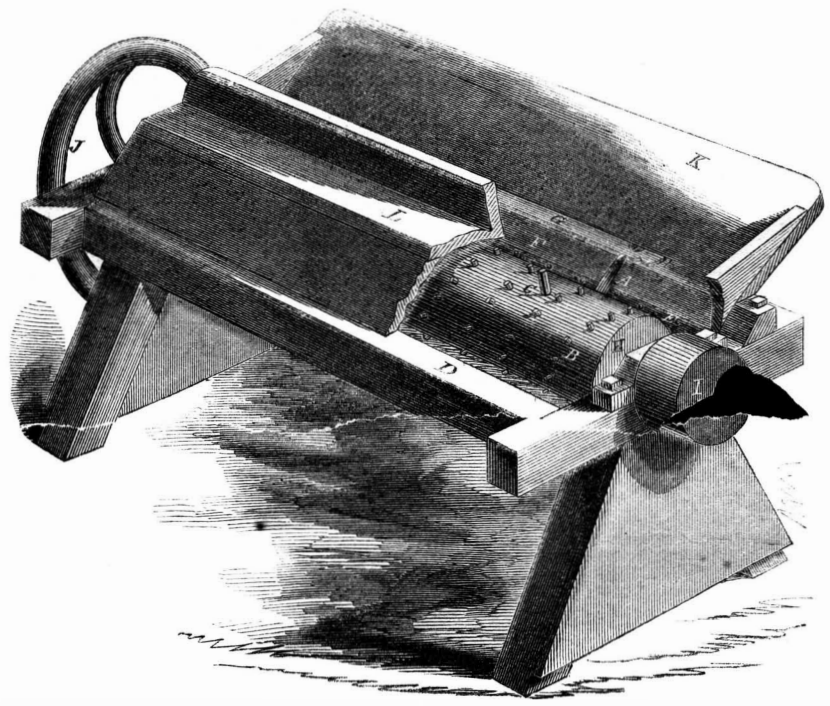
## BRYSON'S CORN HUSKER AND FEED CUTTER.




They move in journals, L, and are operated by cog-wheels, K, from the cog, C. As the crushed stalk passes through these rollers, it is cut into lengths by the knife, P, on whose axle is the fly-wheel, O, and it is also moved by the gearing M N, from the wheel, C. Then the ear not being able to pass through the rollers, J, it remains outside them until it is husked, and it drops through perfectly husked with the butt taken off, and the stalk, butt and leaves crushed and cut fit for fodder for cattle.

Patents were obtained by the inventor Dec. 9, 1856, and Oct. 13, 1857, from whom any further information can be obtained.

## CLINGER & CREMER'S STALK CUTTER AND CRUSHER.




The use of corn and other stalks as fodder is very general, and in order that the animal may obtain all the nutriment which they contain, it is much more economical to present them in a crushed state for the animal to eat.

The subject of our engraving is a machine for cutting and crushing stalks, which we will now describe. D is a frame, at the back of which are four metallic concaves, E, firmly attached to and level with the frame, D. F is a bar secured to D, in which there are slots to receive the convex knives, A, which are held firmly in the required position by a metallic plate, G. H is a revolving cylinder upon which are fixed the knives or strikes, C, and a number of teeth, B, corresponding with the teeth on the concaves, E. I is a pulley by which to revolve the cylinder. J is a fly-wheel; K L is a trough to guide the stalks to the knives, and a cover for the cylinder.

The method of working this machine is as follows:—The cylinder is revolved by the belt-wheel, I, from horse or other power; a bundle of stalks are then taken and dropped lengthwise, three or four at a time, into the trough, K, from whence they will fall upon the stationary knives, A, and by the action of the knives strikes C on the revolving cylinder, each stalk will be cut into four parts, and each part will then fall on the concaves, E, and by the action of the teeth, B, and the teeth on the concaves the stalks will be torn apart in the direction of the fiber, and will be delivered beneath the machine in the best form as food for cattle.

The inventors, P. S. Clinger and C. Cremer, of Conestoga Center, Lancaster county, Pa., obtained a patent April 27, 1858, and will be happy to give any desired information.

### Artificial Method of Producing Sapphires.

Some time since, says the *Mining Magazine*, M. Gaudin obtained artificial rubies by fusing ammoniacal alum before the oxy-hydrogen blow-pipe, with the addition of a small quantity of chromate of potash. It is now said that he has succeeded in preparing perfectly isolated and colorless crystals of alumina, in the form of the sapphire. For this purpose he introduces into a crucible lined with charcoal equal weights of alum and sulphate of potash, both previously refined and reduced to a powder, and exposes the crucible for a quarter of an hour to the full heat of the forge. When the crucible is broken, the crevices of the lining are found to contain a mass consisting of sulphuret of potassium, through which are disseminated the crystals of alumina. The mass is treated with aqua regia, and the crystals left in the form of a fine sand, which is well washed with water. The crystals vary in size according to the mass of materials employed, and the duration of the heat. Those obtained by M. Gaudin, operating on a small scale, were about one millimetre (0·0394 inches) in length. They are colorless, because in this process any metallic oxyds which may be added for the purpose of imitating the natural colors of [illegible] sapphires are reduced by the charcoal. They are extremely limpid, and surpass the natural rubies in hardness. The formation of such crystals depends on the solvent action of sulphuret of potassium.

### Comparative Climates.

Compared with [illegible] up twenty or thirty days earlier on the spring [illegible] western and southern sides of England than in Belgium, and nearly at the same time as in the north of Italy and south of France; but at flowering time, and maturing of fruit, that advance is lost, and maturing of fruit is earlier in Belgium, France, and Italy.

Flowering of plants takes place twenty days earlier in Belgium than in Berlin, or in any of the northern parts of Germany or the south of Sweden, thirty days earlier than in New York, and two months earlier than in Lapland, but the ripening of fruit does not occur till fifty days later than in the latter places.—*Pioneer Farmer.*

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FOR THE WEEK ENDING JUNE 22, 1858.

[*Reported officially for the Scientific American.*]

FLOATING REVOLVING WHARF—Henry Albro, of Covington, Ky. : I claim the revolving or floating pier described, for changing the position of the berth of ferry boats, in order to facilitate their landing when strong currents or other obstacles interfere, the whole being constructed and employed substantially as set forth.

BRICK MACHINES—Francis Allen, of Boston, Mass. : I do not claim the use of a single bar or striker.

But I claim the combination of the prismatic striker, N, and its edge clearer, O, with the hopper, B, and the mold carrier, C, when the several parts are constructed and arranged as described.

I also claim the application of the mold joint coverer or bar, G, to the discharging passage of the hopper, B, and so as to cover the joint between the two abutting ends of two molds, M M', as specified.

I also claim the arrangement of each mold directly over a joint between two sections, a a, of the mold carrier, and so as to cover and protect the said joint, in combination with the projection and recess, or the equivalent thereof applied to the mold and the carrier, and to operate substantially as specified.

RECIPROCATING ROTARY ENGINE—George Ambrose, of New York City : I claim the arrangement and combination in a rotary engine in the manner specified, of the following peculiar features, to wit, first, A stationary axle, A, furnished with two ports, C C', one answering as the supply, and the other as the exhaust, to a series of cylinders, said ports being separated by a transverse S-shaped partition, 1, so that the steam shall be received at one end of the axle and exhausted through the other.

Second, A series of revolving cylinders, D D D D D', with pistons, whose rods have friction rollers, 4 4, on their outer ends.

Third, An annular grooved eccentric rim, F, which has an inner and outer bearing for said friction rollers of the piston rods.

Fourth, Two cut-off slides, 7 7', one arranged at the supply, and the other at the exhaust port of the hollow axle, and intermediate between the revolving hub, D', of the steam cylinders and said stationary hollow axle, for the purpose of regulating the admission of steam to, and the escape of the same from the cylinders, as may be desirable or necessary. All of the above parts being for united use and the purposes set forth.

PREVENTING CARS FROM RUNNING OFF THE TRACK—Leverett Ball, of Auburn, N. Y. : I claim the double flange railroad car wheels, with the broad space, A, between the flanges, and the strong flat-edge flange or car wheels, B, in combination with the iron plate, L, the guide rail, D, the clasp, E, swivel rail, F, and the ends of the rails, C C C C, the whole being constructed and arranged substantially as set forth.

DEVICE FOR ADJUSTING PLANE IRONS—Leonard Bailey, of Winchester, Mass. : I claim the combination of the movable friction plate, I, separate from the plane iron, C, and its adjuster, or the equivalent of the latter with the throat of the plane stock, and to operate the plane iron, substantially as specified.

FURNACES FOR HEATING STEAM BOILERS, &c.—Gideon Bantz, of Frederick City, Md. : I claim the arrangement of the fire chambers A A, contracted throats, e e, auxiliary combustion reservoir, C, provided with the ceina-reversa bridge plate, m n, and door, h', reverberatory chambers, D D, with doors, h h, and the diving or direct flue, E, substantially as and for the purposes set forth.

[A notice of this invention will be found on another page.]

RAILROAD CHAIR—E. R. Barnes, of Brookfield, Conn. : I do not claim the vertical projection, E, on the jaw, B, for the purpose of protecting the ends of the rails from wear, for that, or its equivalent, has been previously used.

Nor do I claim broadly the use of wedges for adjusting the movable jaw, irrespective of the arrangement shown.

But I claim the two jaws, B D, attached respectively to the base plate, A, and wedge, C, and provided with the horizontal projections, c d, the base plate having a recess, a, formed on it, to receive the wedge, and the wedge secured firmly in position by the key, G, substantially as and for the pur ose set forth.

[This invention consists in having one of the jaws of the chair attached to the base plate of the device, and the other attached to a wedge, which is fitted and works in a taper recess in the base plate corresponding in form with the wedge. A key passes transversely through the smaller end of the wedge adjoining the end of the face plate, and by being driven in or through the wedge, draws the wedge within its recess, so as to cause the jaws to clasp the ends of the rails firmly.]

HEMP HARVESTERS—Thomas Berry, of Louisburgh, Ky. : I claim, first, The combination and arrangement, in the manner specified, of the adjustable front supporting wheel, b c, obliquely set slotted guide plate, D C, and adjusting lever, F, as set forth.

Second, Arranging the reel, H, and the gearing which [illegible] on the jointed frame, I J, which is pivoted to the [illegible] frame A, and connected to adjusting an lever, J, substantially as and for the purposes set forth.

Third, The combination of transverse bundling bars, N N', one stationary and the other pivoted, so as to vibrate up and down with the main propelling axle, B', by means of a pin, P, on the axle, B', a pivoted lever, O, a spring rocking arm, l l, and connecting link, K, substantially and for the purposes set forth

[This invention is designed to afford facility and convenience to the driver, while sitting on his seat, for quickly adjusting the cutting bar when necessary, also afford like facilities for adjusting the reel to suit different hights of hemp, and likewise provide a means whereby the hemp can be perfectly bundled and discharged automatically, at intervals, in gavels. The arrangements adopted for accomplishing these results appear to be good, and we think will be found to answer well in practice.]

HANDLE FOR SCREW-DRIVERS—Oliver Bond, of Buffalo, N. Y. : I make no claim to ratchet wheels or cog gearing or spring, when used in connection with tool handles.

But I claim the ratchet ferrules, C and D, when attached to the handles, A and B, and used in combination, the same being protected by the surrounding band ferrule, E, as set forth.

REFRIGERATOR—John D. Burton, of Charlestown, Mass. : I claim the arrangement of the separate refrigerating chambers, the ice chamber, and the air passages leading from the latter into the separate refrigerating chambers.

COMBINED RAILROAD TRACK AND CAST IRON PAVEMENT—Walter Bryent, of Boston, Mass., assignor to Daniel D. Badger, of New York City : I claim the combination of a cast iron pavement and railway, cast and united together in suitable sections, substantially as described.

I also claim the combination of the tenons, a a, mortises, b b, on the ends of the rails, and the alternate over and under lapping tongues, c d, on the edges of the pavement, substantially as specified, for the purpose of interlocking the adjacent sections of the combined pavement and railway.

RAILROAD CAR SEATS AND BERTHS—Sidney C. Case, of Detroit, Mich. : I am aware that chairs have been constructed with hinged seats and backs, for the purpose of enabling them to be folded together, to occupy less space when not being used, and therefore do not lay claim to the particular device for accomplishing this object.

But I claim, first, Extending the backs, A, of the seats nearly to the floor of the car, and suspending said backs on pivots or centers a short distance above the lower ends, and providing the seat portions, C, with pins, c, near their vibrating edges, which enter and rest in corresponding mortises formed in the sides of the car, and partitions forming the ends of the seats, substantially as described.

Second, I also claim the peculiar method of connecting the berth platform, E E, together, and raising them out of the way to the roof of the car, when not desired to be used, and lowering them to form berths, by means of segmental grooves, H H1 H2 H3, formed in or secured to the transverse partitions, D, and round and oblong pins or studs, G G, on the ends of the platforms E F, which traverse in them, the said grooves being so formed, and in such relation to each other, as to enable the berth platforms to be rolled upward, connected, and tilted, and suspended near the roof of the car, and detached and lowered as occasion may require, substantially in the manner and for the purpose set forth.

[A notice of this improvement will be found in another column.]

MACHINE FOR RAISING MARL DIRT, &c.—Thomas F. Christman, of Wilson, N. C. : I claim the adjustable marl dirt and water elevator, in combination with the movable pinions, cross bar, and endless apron, as described, and with the additional elevator and extension piece, for the purpose set forth, and substantially as described, in the manner specified.

MODE OF APPLYING LEVER POWER—George E. Clay, of Stillwater, Minn. : I am aware that oscillating spring fall arms or bars, and ratchet wheels have heretofore been employed for giving a continuous motion to shafts, and I do not therefore lay claim to these parts.

But I claim the combination of the oscillating arms or bars, G H, secured to the pinion, E, and cog wheel, F, which turn loosely on the horizontal shaft, A, and pinions, K L, and cog wheel, M, for gearing the two arms together, substantially in the manner and for the purpose described.

[The nature of this invention consists in so gearing the vibrating arms to which the ratchet pawls are attached together by a series of cog wheels as to enable a continuous rotary motion to be transmitted to a shaft by the vibratory or oscillating movement of a lever on which the motive power is first exerted.]

REGULATORS—John H. Cooper, of Philadelphia, Pa. : I am aware that gas regulators in which an inverted cup loaded with weights and attached to a valve are in common use. This I do not claim.

But I claim guiding the inverted cup, G, by an arm, P, when the latter is loosely jointed to the casing and to the cup in the manner specified.

I also claim combining the coupling screw, D, the valve seat, e e, chamber, E, and the inclined outlet, B, with each other, for the purposes set forth.

GAS BURNERS—Robert Cornelius, of Philadelphia, Pa. : I claim constructing fish-tail gas burners with an interior annular space, g g, extending to the commencement of the holes of discharge, e' and f'.

I also claim the auxiliary holes, l l', or 1 2 3 4, in combination with a fish-tail burner, arranged and operating substantially as described.

CAR COUPLINGS—C. B. Cotter, of Harrisburgh, Pa. : I claim the peculiar arrangement of coupling bar, A, as constructed in combination with the spring jaws, c e, the lugs, m, and the right and left screw, g, for the purpose of making a self-connecting and self-disconnecting car coupler and friction bumper, as is fully described.

CORN HARVESTERS—R. B. Corbin and Jas. Morris, of St. Augustine, Ill. : We claim the rake teeth, F, and box, E, attached to the body A, of the wagon, as shown, and made to communicate with said body, A, by means of the inclined trough or plane, G, the whole being arranged as and for the purpose set forth.

[The object of this invention is to gather the ears of corn from the standing stalks, the latter being left in the field in their original position. The invention consists in attaching to one side of an ordinary box wagon; a box having a rake at its front side, and an inclined trough connected with it and the wagon body, the arts being so constructed that as the wagon is drawn along the rake will strip the ears from the stalks, the ears passing into the box, from which they are raked up the inclined trough into the wagon by an attendant.]

METALLIC LATH—John B. Cornell, of New York City: I claim forming an improved plaster-supporting metallic surface of a closely united series of sheet metal sections, whose edges are first inclined inwardly and then outwardly into substantially the shape shown, and for the purposes set forth.

METALLIC ROLLING SHUTTERS—William W. Cornell, of New York City : I claim my improved sectional metallic shutter, composed of a series of sections, whose edges are first brought to the proper shape and then combined with each other, by securing said sections to elastic metallic strips, substantially as set forth.

PANS FOR EVAPORATING CANE JUICE—D. M. Cook, of Mansfield, Ohio : I do not wish to be understood as claiming the corrugation of sheet metal into flanges and spaces, [illegible]gs to form an evaporation with transverse pa[illegible] running from opposite sides, thereby produc[illegible]inuous and opposite current in the fluid, [illegible]uch is a well-known device.

D[illegible] the [illegible]erator in combination with fireplace and flue, k, the rockers, f f, the leveling frame, p, the rubbers, g, and the fianges, o, as described, and for the purposes set forth.

CUTTING BUTTON HOLES—Charles Currier, of Providence, R. I. : I am aware that rotary cutters and tools of various kinds have been arranged or connected with rotating stocks so that in the same implement tools of various kinds, and of different sizes, might be used. I do not claim, therefore, the rotating cutters, F, when separately considered.

But I claim the lever, E, provided with cutters, F, in combination with the adjustable bed, C, and gage, D, arranged substantially as and for the purpose specified.

I also claim the snips, f, made separate from the parts e, of the cutters, F, and attached to the plates, g, by means of the screws, i, whereby the snips may be readily detached from the parts, e, of the cutters, and sharpened or ground with facility.

[Rotating cutters, peculiarly constructed and fitted within a lever or handle, an adjustable bed, and adjustable guides are employed in this invention, so that a very simple and efficient implement is obtained, for the pur ose designed, and one that may be readily kept in proper working order, and used for cutting button holes of various sizes.]

PLOWS—Alexander Dickson, of Hillsboro, N. C. : I claim the supplemental land-side, F, and coulter, G, arranged and applied to the plow as shown, and for the purpose set forth.

[The object of this invention is to render an ordinary surface plow available, when necessary, as a sub-soil plow. The invention consists in the use of a supplemental land-side, and a coulter attached to the plow.]

COUPLING BOX FOR SHAFTING—William B. Dunning, of Geneva, N. Y. : I claim, first, The coupling box, substantially as and for the purpose specified.

Second, The means used for securing the same together, as described and set forth.

REPAIRING CAST IRON CYLINDERS—Samuel Falkenbury, of Susquehanna Depot, Pa. : I claim the uniting the old and new cast iron in the box of steam cylinders, which consists of drilling the broken parts for increase of expanding surface, and the application of a charcoal or other fire to equalize the expansion previous to pouring the metal, in the manner set forth in the specification.

METALLIC ROOFING—J. C. Gaston, of Oxford, Ohio : I claim, first, Connecting the plates for a metallic roof by means of yielding joints, consisting of only two thicknesses of metal, and formed by overlapping the flanges turned in the same direction on opposite edges of each plate, in combination with the boarding of the roof, formed of different thickness of plank, to correspond with the difference in the level of the plates when connected, and so arranged as to give support to the under side of the plates, and also to the joints, as described.

Second, Combination of the lock on the lower corners of the plates (formed by the hook, e, in one plate, and the slot, f, in the other, or their equivalents,) with a side joint formed by the overlapping of the plates.

CORN HUSKERS—Burton Hazen, of Cincinnati, Ohio: I claim the stationary and rotating knives, I G, and rotating bar or hammer, H, combined and arranged to operate as and for the purpose set forth.

[This invention consists in the employment of a stationary and rotating knife and rotating hammer, arranged for the purpose of stripping the husks from the ears. The invention also consists in the employment of a rotating cylinder of slitting knives fitted within a cylindrical yielding shell, also provided with slitting knives, and arranged and operated so as to slit the husks for upholstery purposes.]

SHINGLE MACHINE—Jerrie R. Hall, of Brunswick, Me. : I do not claim standing the bolt on the end, to be sawn sidewise, as the same thing in principle is accomplished by other machines.

Neither do I claim the wheel with alternate long and short teeth.

But I claim, first, The combination of rods, q q', with their pins, 7' 7, thimbles, 5' 5'', with their slots, 6 8, slaves, 2 2', and the palls, 1 1'', in combination with notched wheels, 4 4', and feed rollers, T T', for feeding the bolt to the saw.

Second, The arrangement of frame, U, in relation to the other parts, for fastening and holding the bolt while being sawn.

Third, The hinged fender, E, with its cord and spring, Z.

Fourth, The combination of springs m' and n', clutch lever, j', lever, R, car, n, with its catch, S', cams, Q and P', in combination with pulleys, l' l'' and h h', for giving motion to the carriage, Y, all of which operate substantially as and for the purpose set forth.

CORN PLANTER—Pascal Hatch, of Norwich, Vt. : I claim combining the glazed receptacles, C C, with grain boxes, A A, and with the delivering apparatus connected therewith, when said parts are constructed, arranged and operated substantially in the manner and for the purpose set forth.

AIR-HEATING FURNACES—John P. Hayes, of Philadelphia, Pa. : First, I claim admitting hot air to the upper surface of the fire for the combustion of the gases arising therefrom, by making the fire tiles or lining of the fire chamber in numerous vertical sections, with the depressions, u y, in the adjoining sides of the same, so that when the said sections are placed together, side by side, in the fire chamber, air spaces or flues, u y, will be produced between, so as to heat and discharge currents of air into the upper part of the fire chamber, in the manner described, the said sections being constructed and arranged together substantially as set forth.

Second, I claim making a direct communication between the said air flues, u y, and the ash pit, D, by means of the openings, w w, or their equivalents, in the foundation plate upon which they rest, substantially as described.

Third, I claim forming the top and side plates of the furnace body, A, so that each of its said two and side plates, l and l', may be combined with a row of pipes, m m, opening at each of their ends, upon the same side of the plate, as described, and produce hot air flues, m m, through the body, A, of the furnace, when the said plates are united together at their upper edges, all substantially as and for the purposes set forth and described.

CAMPHENE LAMPS—Elias J. Hale, of Foxcroft, Me. : I do not claim merely making a wick adjustable with respect to a solar cap.

But I claim an improved lamp having its wick tube made adjustable and movable with respect to its solar cap, or having the latter made adjustable with respect to the wick tube, the whole being substantially in manner and so as to operate as specified.

MACHINE FOR SETTING SPOKES IN HUBS—Andrew Hafer and George Wilkinson, of Colon, Mich. : We claim the disk, A, having teeth, i, formed on a portion of its periphery, and curved grooves, a, made in its inner face, the plate, B, provided with slotted arms, in which jaws, C, are placed, the plate being provided with a pawl, h, and handle, E, and fitted to the disk by means of the pin, f, and nut, G, the pin forming the axis of the sweep, D, the whole being combined and arranged as and for the purpose set forth.

[A notice of this improvement will be found on another page.]

SEEDING MACHINES—Samuel F. Jones, of St. Paul, Ind. : I do not claim separately any of the parts, or which viewed irrespective of the arrangement shown and described, for attaining the desired end.

But I claim the slides, M I J, arranged respectively within the box E, and tubes F G, and operated through the medium of the tube, S, shaft, P, pendent, O, and rods, N L K, as shown and described, for the purpose set forth.

[This is a novel arrangement of the parts composing the seed-distributing device, whereby the operator has full and perfect control over the same, without regard to the draft movement of the machine, and also that the seed may be deposited in the exact spot wished by the operator.]

METALLIC WHEELS FOR VEHICLES—Thomas McConaughy and James McCollum, of Burnsville, Ala. : We claim the combination of the feathered box, wrought metal bands and system of braces, C, with the screw rods and rim of the wheel, constructed, arranged and operating substantially as and for the purpose set forth.

CORN HARVESTERS—Darius Landon, of Wyandotte, Ohio : I claim the platforms, F and G, in combination with the endless belts, V2, and shock supporters, P P', for carrying the shocks of corn thr[illegible]ı the machine, and leaving the same in a standing position on the ground.

WASHBOARDS—Joseph Keech, of Waterloo, N. Y. : I claim the combination of the central beaded rib, R, with the corrugated plates, B B, constructed, arranged and operating substantially as and for the purposes set forth.

HORSESHOE MACHINE—William W. Lewis, of Cincinnati, Ohio : I claim, first, The combination with the stationary table, B, of the mandrel, C P P, the stationary front die, a, sliding side dies, b b, and top die, e, all applied to operate together, substantially as described.

Second, Operating the dies, b b, which form the sides of the shoe, by means of the upright sliding rods, F' F', with their wedge-shaped ends, the levers, F F, and the cams, D' D', on the shaft, D, the whole combined and applied as described.

[A full description of this invention is given in another column.]

GANG PLOWS—Don C. Matteson, of Stockton, Cal. : I claim the arrangement as described of the false beam, N, goose neck, G, axle, w, lever, i, catch, L, and the system of plows attached to their frame, as set forth, the whole being constructed and operating substantially as and for the purposes specified.

VAPOR LAMP BURNERS—A. M. Mace, of Springfield, Mass. : I do not claim a packing of wire cloth, cotton, or any analogous material.

Neither do I claim the use of asbetos, when used as a wicking to act by capillary attraction.

But I claim the use of the heating and vaporizing tube or retort charged with asbestos and fluid, in the manner and for the purpose set forth.

VAPOR LAMPS—A. M. Mace, of Springfield, Mass. : I do not claim the use of a heat-retaining cap, connected with a retort of a particular construction, as such a patent was granted to me in April 22, 1856, but generally it may be applied to any form of chamber or retort producing the same results.

Neither do I claim the elevated reservoirs, except in connection with parts mentioned.

Neither do I now claim expanding the vaporizing tube into a chamber, as I intend applying for a separate patent for that device.

What I claim is, first, Combining the cap or heat-retainer, H, with vaporizing tubes or retorts, constructed substantially as described, when so arranged over the flame as to operate in the manner set forth.

Second, I also claim the combination of the heat-retainer, H, and vaporizing tube, connected substantially as described, with the elevated reservoir, the whole arranged and operating with respect to the valve, C', and burner, K, as set forth.

CORN SHELLERS—William H. Main, of Liverpool, Ohio : I claim the use of the balance wheel, G, in combination with the open hub jaws P, teeth R, and springs O, when arranged in the manner substantially as set forth.

I also claim a series of spur wheels, T, arranged with spiral springs and sliders, or their equivalents, as described, and in combination therewith the spiral cam, V, by which the spur wheels are driven, when constructed and operated in the manner and for the purpose specified.

SEED PLANTERS—Joseph McKown, of Gardstown, Va. : I claim the arrangement of two or more alternately operating slides, F G, cut-off device, H I, crank shafts, J N O, intermediate gearing, L M, adjustable standards, J', and extension connecting rods, K K K' K', substantially in the manner and for the purpose described.

[With this seed planter the seeds are drawn from the hopper continuously by two alternately-acting slides, and dropped into seed tubes, which conduct it into the soil. The seed, as fast as dropped, are covered by means of shares and a roller. We think this machine will plant seed well.]

CORN HUSKER—Lemuel R. Mears, of South Abington, Mass. : I claim an improved corn husker, as made of a combination of a breast shield, a supporting bar, and cutting apparatus, the breast shield to be applied to a person, and the cutting apparatus and supporting bar to be operated in manner as specified.

And I particularly claim the arrangement of the cutters and bearer, viz., so as to extend in opposite directions from the supporting bar and the slider, in manner and for the purpose as explained.

RAILROAD CAR SEAT—John Millar, of Paterson, N. J. : I am aware that car seats have been arranged to turn horizontally; but I am not aware that the two seats of each base or stand have been made separately or detached, and so connected to the base or stand that they may be turned independently of each other.

Neither am I aware that the fastening or catch, arranged as shown, has been used in connection with a pivoted back. I do not claim broadly, therefore, the horizontal rotating movement of a car seat, for the purpose of adjusting the same to face in either direction.

But I claim the two horizontal rotating seats, B B, attached to the face or stand, A, as shown, in combination with the pivoted backs, d, attached to the seats, B, and arranged with the bars, C, having the rods, D, and springs, F, attached, and the pins, h, connected with the upright parts, c, of the seat, the whole being arranged substantially as described.

[By a simple device, consisting in having two seats with adjustable backs attached, secured to a permanent base or stand, so that one seat may rotate independently of the other, and the backs also being adjustable to a greater or less degree of inclination as the occupants desire, a very comfortable seat is obtained.]

TREATMENT OF METALLIC SULPHURETS—Alfred Monnier, of Camden, N. J. : I claim the process of obtaining oxyds of iron, copper, cobalt, nichel, zinc, or other oxyds, from their native sulphurets, or arsenic-sulphurets, by mixing them in a state of powder with the substance as described, in order to expell all or nearly all the sulphur and arsenic.

SEEDING MACHINES—Wm. Morehouse, of Davenport, Iowa : I am aware that markers have been previously used and arranged similar to the ones described. I therefore do not claim the markers separately considered, Nor do I claim the reciprocating seed slides, F, nor the seed conveying tubes, S, for they have been used.

What I claim is, the cams, J, attached to the axle [illegible] and laterally moving rods, K M, attached respectively to the shafts, H g, the seed slides, E, being attached to the shaft, H, by rods, G, and the shaft, g, being attached to a slide, z, the above parts operating as and for the purpose set forth.

I also claim the markers, n, attached to the frame, N, when said markers are used in connection with the cams, J, and rods, M K, for operating the seed distributing device, and the whole arranged to operate as and for the purpose set forth.

[This is an improvement in that class of seeding machines by which the seed is planted in hills and in check rows, two rows being planted at the same time. The invention consists in a novel means employed for operating reciprocating seed slides and markers, whereby the distribution or stopping of the seed is placed entirely under the control of the driver, and consequently even and uniform planting is secured.]

AIR CELLS FOR GIVING BUOYANCY TO SHIPS AND OTHER VESSELS—Samuel Nowlan, of New York City : I claim the arrangement of a series of cylindrical air vessels beneath the deck or decks of vessels in combination with the reels and their appurtenances, whereby the said air vessels may be readily removed from or brought into position at pleasure to operate substantially in the manner as specified.

I also claim the flexible induction tube communicating through the hollow reel shaft with the air pump

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and the air vessels. by means of one or more suitable valves arranged in the manner and for the purposes described.

COMBINATION LOCKS—Stuart Perry, of Newport, N. Y. : I claim, first, A key of such construction in combination with a lock without a keyhole or other opening from the outside to the working parts inside that the said key may be applied to the lock without the aid of an index, figures, letters, or other marks that require a light to be seen, and which key shall govern with precision all the necessary movements of the shaft by which the slides and tumblers of the lock must be adjusted, substantially in the manner and for the purpose described.

Second, I claim in the construction of locks without keyholes, the employment of two movable shafts, one of which adjusts the slide tumblers, both being accessible from the outside, and one within the other, substantially in the manner and for the purpose set forth.

Third, I claim the method described of adjusting the slides by means of the two movable shafts, which, when operated, are guided in their movements by the key above described, substantially in the manner and for the purpose set forth.

Fourth, I claim the restorer, Q, in combination with cam, R, shaft, E, and bet, F, by which all the movable parts in the lock are moved by the force of the hand only, and in the locked and unlocked position are held fast, substantially in the manner described.

Fifth, I claim so constructing the ring cam, L, that it shall move the slide carriage N at the proper moment, and that it shall hold said carriage fast at all other times, substantially in the manner and for the purpose described.

Sixth, I claim the steel arm, D′, or its equivalent arms, the peculiarly shaped slide, y 4, substantially in the manner and for the purpose set forth.

Seventh, I claim the piston, b', for coupling the slide carriage cam, L, with the wheel, G, of the shaft, D, for the purpose described.

PLOWS—H. M. Platt, of Darien, Conn. : I claim the arrangement of the screw-shaped plowshare, A, having wings, E, with boxes, H and F, wheels, I, and roller, D, the whole being constructed and operating conjointly in the manner and for the purpose set forth.

CLAMPING AND LATERALLY FEEDING THE LOG IN SAW MILLS—J. C. Past, of Wilmington, Del. : I claim the method described of clamping and holding the log, and also the device by which the lateral feed of the log is regulated, substantially as described.

SOLUTIONS FOR CLEANSING WOOLENS, &c.—E. F. Prentiss, of Philadelphia, Pa. : I do not desire to claim the employment of silicate of soda as an ingredient in the manufacture of soap, as that has been tried before.

Nor do I claim any mode of making alkaline silicates, nor yet the solution of alkaline silicates with chlorine or chlorides for bleeching and finishing textile fabrics, as these do not possess the cleansing properttes of my solution prepared and used as described.

But I claim the employment of silicate of soda solution by itself, when prepared and used substantially as described for cleansing and softening the fabric in the fulling mill or wash tub as a wash mixture.

APPARATUS FOR SIFTING COAL ASHES, &c.—L. H. Proctor, of East Sangers, Mass. : I do not claim the application of the sieve, C, to its vibrating frame, in manner so as to enable such sieve to be tilted or turned over laterally so as to discharge out of it such contents or ma ters as may not be small enough to pass through its meshes.

But I claim the arrangement of the inclined partition or chute, R, and the two discharging openings, K L, with respect to the sieve, C, made capable of being revolved in manner substantially as set forth.

I also claim in combination with the discharging passages, K L, arranged so as to lead out of the sieve chamber as described, a flap or valve, M, so combined or connected with the turning sieve, C, as to operate with respect to the two discharging passages, K L, substantially as described during the rotary or tilting movements of the sieve.

CHEESE VAT—H, A. Roe, of West Andover, Ohio : I claim attaching the milk vat to the casing by a hinge joint, or its equivalent, and so arranging the whey gate that the weight of the milk vat and its contents will act as a lever in keeping the celler and packing, C, in close contact with the inner surface of the water chamber.

I also claim, in combination therewith, the short legs E′, and the jointed legs. E″, all operating in the manner and for the several purposes set forth.

CABINET FOR SEWING MACHINES—F. A. Ross and W. H. Marshall, of New York City : We claim the hinged case, B, to form a sewing platform, arranged and constructed substantially as described.

OIL CUP FOR MACHINERY—Robert Ross and William Holland, of Philadelphia, Pa.: We claim the combination of the spring valve stem, with the screw valve, e, in the intermediate chamber, b, as set forth, each operating in conjunction with, and at the same time independently of the other to the extent and in the manner set forth.

We also claim the air passage, u, within the stem, h, in combination with the oil passage, m′, around the stem, h, in the manner set forth.

ORE SEPARATOR—H. P. Russ, of Russville, Cal. : I claim the series of inclined circular plates, a a, in which the water passes from one plate on to the next, while the metallic particles are retained in cavities in the surfaces of said plates, substantially as and for the purposes specified.

FURNACES OF BOILERS AND STOVES—S. F. Savage, of Albany, N. Y. : I do not wish to be understood as making claim to the use of a perforated air chamber to supply atmospheric air in small jets to inflame the gaseous products of combustion, as I am aware that this has long been known and tried in various forms, but not, as I verily believe, substantially in the manner or with the results specified.

What I claim is, the arrangement of the air chamber, substantially as described, with the perforated bottom of a conical or equivalent shape, placed in the upper part of the fire chamber, with the concave surface downward toward the fire and with a central aperture leading to the chamber of inflammation, substantially as and for the purpose specified.

COOKING STOVES—S. B. Spaulding, of Brandon, Vt. : I do not claim any particular form or construction of stove.

What I claim is the extending of the bottom of the stoves and flues at the back end, so as to form a boiler seat for the reservoir, so that by the peculiar arrangement of the sliding plate or damper, the reservoir can be heated at pleasure without affecting in the least the other operations of the stove.

FRAME FOR DRYING CLOTHES—Chester Stone, of Ravenna, Ohio : I claim the described manner of constructing a clothes' frame, consisting of the standard, A, head, B, arms, C, braces, D, and cords, G H I, when arranged and operating in the manner and for the purpose specified.

PORTFOLIO FILE—P. W. Tay, of New York City : I do not claim, separately, the sides and back, A B, or the mode of filing by the cords, D D, and rod, C.

But I do claim, separately, the elastic bands, E E, and and the loops, F F, arranged and operating as described.

I also claim the combination of the portfolio cover with the file, loop and bands, substantially as described, as forming a new, convenient and useful article.

GEARING FOR MACHINERY—Wm. Webster, of Jefferson County, Washington Territory : I claim the compound annular cog wheel described, the same being constructed and operating substantially in the manner specified.

I also claim, in combination with a wheel, having two or more concentric rings of cogs the use of a corresponding number of pinions on one shaft, or of a shifting pinion arranged for combined operation with the wheel, substantially as and for the purpose specified.

GAS RETORTS—Charles N. Tyler, of Washington, D. C. : I claim, first, The combination of the cavity, a, with the outlet, b, of the hydrogen retort in the manner and for the purposes substantially as set forth.

Second, I claim elongating the end of the resort, A, so that the cavity, a, may be arranged on the inside of the furnace for the purposes set forth.

MASTING AND RIGGING VESSELS—Wm. Webster, of Jefferson County, Washington Territory : I claim, first, Substituting for the compound, and connected masts now in use on large vessels, independent and disconnected masts made of a single stick of timber, as and for the purpose described.

Second, Attaching the masts to the hull by shrouds placed at the angle with the mast as described and represented.

Third, The truss bands for attaching the yards to the masts, and holding them at any desired point thereon, constructed and operating as described.

Fourth, The lift bands to which the lifts and slings are attached, constructed and applied as described.

OIL CUPS FOR LUBRICATING ENGINES—S. H. Whitmore, of Cincinnati, Ohio : I claim the combined arrangement of the external valves, G and H, mounted on a central stem, F, and operating as described, in connection with the globe, A B C D F.

MACHINE FOR REPLACING RAILROAD CARS ON THE TRACK—John White, of Boston, Mass. : I am aware that the mechanical devices which I employ have all been previously used for raising or for moving heavy bodies, and also that for the purposes to which my apparatus is applicable; machines have been constructed in which some of the features of mine have been used, but without producing a similar apparatus. I therefore do not claim any of the constituent parts of this machine individually or collectively, except when arranged as described.

But I claim as a new article of manufacture the described "car replacer," consisting essentially of the beam, A, with its two separate and independent carriages, B, running on rolls, g, with the screw jacks, D, for raising the beam, the whole constructed and operating in the manner substantially as set forth for the purpose specified.

PADDLE WHEELS—George Wingate, of Philadelphia, Pa. : I claim connecting side wheels for steamboats with recesses, in which blocks are arranged to slide toward and from the center of rotation of the wheel as the latter revolves, by means of the plates, F′ F″, and G′ when constructed and operating on the blocks, b. as described, so as to cause the partitions between the said recesses to assume the character and duty of floats throughout a portion of the circumference of the wheel, the outer surfaces of the said blocks being level with the outer edges of the partitions throughout the remaining portions of the circumference, as set forth and for the purposes specified.

MACHINES FOR PICKING CAP WASTE—A. A. Wood, of Jersey City, N. J. : I claim the combination described of a reciprocating toothed bed with vibrating toothed feeding rollers, or their equivalent, with a stationary toothed cover, when the teeth are constructed and arranged in reference to each other in the manner described and shown, to pass the waste or cotton through the machine without seriously rending the fiber, and at the same time securing a precise and even feed to the bed by the combination of the vibrating toothed rollers working at a corresponding speed as set forth.

RESTORING WASTE VULCANIZED RUBBER—Francis Baschnagel, of Beverly, Mass., assignor to the Beverly Rubber Company : I claim the application of heat from 150° to 600° Fah., to waste vulcanized rubber with or or without immersing it in cold water or any other cooling fluid as specified for the purpose of restoring the same, so that it may be used again in the manufacture of india-rubber goods and substances, hereby expressly disclaiming all and every right to the application of artificial heat to new rubber, vulcanized or not vulcanized, and to the application of heat to rubber in any manner and for any purpose except as above set forth.

SAFETY VAULT COVERS—E. L. Brown, of Boston, Mass., assignor to B. F. Brown. of Bangor, Me. : I claim the hinged lid, E, in combination with the guards, F, so arranged as to support the lid when raised, and to lock it when closed, as set forth.

VALVES FOR DRY GAS METERS—C. C. Lloyd (assignor to Wm. Hopper and R. W. Gratz), of Philadelphia, Pa. : I claim, first, The construction of the rotary valve, e e, with a series of breaks or edges as at f p p, and q q, arranged and operating so as to scrape the upper surface of the valve seat.

Second, The drip, K, and valve seat, g g, arranged and operating so as to collect and carry off any liquid deposit in the meter.

Third, The valve carriage, D D, arranged and operating substantially as described.

SKIRT HOOPS—R. J. Mann, of Brooklyn, N. Y., assignor to L. A. Osborn, of Newark, N. J., and I. J. Vincent, of New York City : I do not claim as new the expansion of the hoops in ladies' skirts, for that is not new.

But I claim, first, The peculiar formation of the slide, g, the said slide being made of brass or other metals and having its slides bent two ways, the one clasping the end of the loop and made fast thereto, and the other end made to slide freely on the hoop.

Second, Securing the hoop, d, to the perpendicular straps by means of small clamps, constructed as described.

Third, The formation of a bustle or corrugated projection, a a, on the upper hoops on the back of the skirt in the manner and for the purpose set forth.

COOKING STOVES—G. G. Richmond and G. W. Pitt, tock, (assignors to themselves, C. Phelps, and J. Lown, and said Pittock having assigned his interest in the same to D. B. Carver), of Troy, N. Y. : We claim, first, The arrangement of the passages, J, provided with dampers, C, with hot air chamber, D, and slide, K or L, in the oven, C, as described, whereby the intensely hot air of the chamber, D, may be directly applied to the otherwise insufficiently heated underside of articles baking upon the slide, and to the upper side of those on the oven bottom.

Second, We claim. in combination with the fire pot, A, plate M, chamber, D, passages, J, and slide, K or L, in the oven, C, arranged together in the stove as described, the top plate, E, of the oblong hot air chamber, D, constructed substantially as represented, whereby the heat of the air admitted into the oven between the two tiers of articles baking is augmented.

STUFFING BOXES—H. F. Read (assignor to himself and S. J. Burr), of Brooklyn, N. Y. : I claim, first The metallic rings, r r r, placed upon the shaft, A, for the purpose of protecting from friction the shaft and flexible tube, C, within which said wings are placed.

Second, The arrangement of the flexible tube on the outside of the metallic rings, so as to allow said flexible tubing to give or twist equally its whole length, and also to carry with it each ring a proportionate distance according to the distance traveled by the shaft.

Third, In combination as described, the thimble, E, as used for the purpose of packing the joint at the end "g" of the outside case, D, and at the same time holding permanently one end of the flexible tube.

Fourth, The combination of the flexible tubing, and the metallic rings working together on the shaft, together with the metallic casing, D, substantially in the manner described and for the purposes set forth.

SEWING MACHINES—H. S. Snow (assignor to himself and G. F. Snow), of Meriden, Conn. : I do not claim as new imparting motion to the looper by means of the needle, nor do I claim the moving of the feeder by means of the carrier, as both have been used before.

But I claim the combination of the lifting feeder, R, with lever, T, or its equivalent, for lifting the feeder from the cloth, by the descent of the needle carrier, the same being arranged and operated substantially as described.

RIVETTING MACHINE—P. B. Tyler and Wm. Jones, of Springfield, Mass., and Benjamin Lathrop, of Sandusky, Ohio, assignors to P. B. Tyler, aforesaid : We claim the employment of a pean as described, shaped to the configuration of the head of rivet, and operated in the manner and for the purpose set forth, by which a rivet head is formed by a succession of light blows around the circle.

SEWING MACHINES—A. F. Johnson (assignor to F. F. Emery), of Boston, Mass. : I claim taking the loop from the needle by a revolving hook, operating in the manner substantially as set forth.

I also claim, in combination with the revolving hook, 1, the groove, 3, and the lip, 4, or its substantial equivalent, for holding the loop distended, in the manner substantially as described.

### RE-ISSUE.

EXTRACTING STUMPS—Wm. W. Willis, of Orange, Mass. Patented March 6, 1855 : I claim the combination of the draught hook, R, shears, H, and pulley, N, substantially in the manner and for the purpose set forth.

I also claim the application and arrangement of the links, E E, or their equivalents in combination with the lever, A, so that the said links may alternately be put into connection with the draught chain, I, by means of the two link hooks, J and K, or their equivalants, substantially in the manner and for the purpose set forth and described.

### EXTENSION.

INDIA-RUBBER FABRICS—Chas. Goodyear, of New Haven, Conn. Patent dated June 15, 1844—Re-issued Dec. 25, 1849, in two separate patents, being Nos. 156 and 157 of Re-issued Patents, viz. :—

No. 156.—PROCESSES FOR THE MANUFACTURE OF INDIA-RUBBER—I claim the curing of caoutchouc or india rubber by subjecting it to the action of a high degree of artificial heat, substantially as described and for the purpose specified.

And I also claim the preparing and curing the compound of india-rubber, sulphur and a carbonate of other salt or oxyd of lead by subjecting the same to the action of artificial heat, substantially as described.

No. 157.—FELTING INDIA-RUBBER WITH COTTON FIBER—I claim incorporating the fibers of cotton or other substance with india-rubber by preparing the fibers of a fleece or bat of cotton or other fibrous substance into a sheet of india-rubber in the green state without subjecting the fibers, after they have been incorporated to a stretching or drawing operation, substantially as described.

### DESIGN.

STOVE PLATE—S. W. Gibbs, of Albany, N. Y.

## Applying for Patents.

MESSRS. EDITORS.—Will you please to publish an article in your valuable paper stating the process a person has to go through to procure a patent right from the Patent Office at Washington. Whether it is necessary for the person to go to Washington, or if the business may be transacted by communication. Also as to the cost. Whether government pays the cost of illustrating, or the individual. An article on this subject will not only be profitable to me, but interesting to the community. S.

ANSWER.—The business of procuring patents for others is one to which we have been so long accustomed that it seems to us a very easy and simple matter. As a consequence of our familiarity with the subject we are apt to think that everybody is equally well posted, and thus, perhaps, we become neglectful in giving the public suitable instruction and information. The above letter we received from the editor of a prominent agricultural paper in Illinois, with a request that we should answer it in our columns. We most cheerfully comply.

The process of procuring a patent is as follows :—1. Prepare a working model of your invention, made either of wood or metal, in size not exceeding twelve inches in any of its dimensions. 2. Make a drawing of the model, showing with particular clearness the new parts invented. Sometimes several different views or figures are required in order to illustrate the improvement and its modifications. Make a tracing of the drawing, so that there shall be two copies. 3. Write out a "full, clear, and exact description" of the invention, referring, with suitable letters, to the drawings. This description is called the specification, and upon the care used in its preparation the validity of the patent often depends. 4. Prepare the petition and oath, for the forms of which see a pamphlet called the "Rules and Regulations of the Patent Office," published by the Commissioner of Patents, and sent gratis on application to him. Attach the petition and oath to the specification. 5. Send the model, both copies of the drawings, the specification, and $30 in gold, directed to the Hon. J. Holt, Commissioner of Patents, Washington, D. C. Forward the model and money by express, prepaid. The papers may go by mail free of postage. 6. The model, drawings, and papers must be furnished at the expense of the applicant. 7. It is not necessary for the applicant to make a journey to Washington in order to secure a patent. The whole business can be transacted by correspondence.

The above comprises a complete answer to our correspondent's inquiries, and will convey to every reader a general idea of the *modus operandi* of taking out a patent. If further information is desired, it can be had from the circular which we print for gratuitous distribution. We would remark, by way of caution, that the production of patent documents requires skill and experience, and that generally it is about as useless for an inventor to undertake the preparation of his own papers as it is for a person inexperienced in law to attempt the management of his own suit. Applicants for patents will usually consult their own interests by employing the best professional assistance.

Those who seriously intend to apply for a patent should usually have a preliminary examination made at Washington, to ascertain whether their invention is probably patentable. This can be done for a small sum through reliable attorneys, and it often saves the whole expense of models, drawings, &c. *Fifty per cent* of all applications that are made for patents without preliminary examination, are rejected for want of novelty.

## Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims :—

FURNACE FOR WET FUEL.—The object of this invention is to provide a furnace for the more perfect combustion of tan, saw-dust, bagasse, and all other kinds of refuse fuel in a wet or dry state as well as of wood or coal, and this it does perfectly. It is, however, specially adapted to burning wet fuel, and is the invention of Gideon Bantz, of Frederic City, Md.

SLEEPING RAILROAD CAR.—This invention consists in so forming and suspending the seats in railroad cars as to enable them to be folded downward to the floor and to be thus converted into a single or double sleeping berth; and in arranging upright partitions between the backs of the seats, on the sides of which segmental grooves and ledges are formed, so that projections on the ends of both platforms can move in them in such a manner as to enable the berth platforms to be brought into such positions between the partitions as to form two additional berths, and to be connected and raised out of the way, to the ceiling of the car, when not required for use. Sidney C. Case, of Detroit, Mich., is the inventor.

GUIDE FOR SETTING SPOKES IN WHEELS.—It is seldom that wheelwrights can depend on the hubs as a gage to make a true wheel, as they are liable to shrink and get out of center, so the gage is always applied to the spokes, and if they be all of equal length from the periphery of the hub and of equal dish, then the wheel is true. This invention is intended to secure this end by a very simple device, it readily fits on the hub and being once set to the requisite length and dish, it can be turned round to serve as a guide and gage for each spoke. This valuable device is the invention of A. Hafer, and G. Wilkinson, of Colon, Mich.

HORSESHOE-MAKING MACHINE.—The manufacture of horseshoes by machinery is becoming a very large trade, and the demand for machine-made shoes is gradually increasing and if nothing else could be said in their favor, they are at least cheaper and more regular in form than those produced by hand. W. W. Lewis, of Cincinnati, Ohio, has invented a machine which, being fed with bar iron, cuts off the proper length, grooves and punches the nail holes in it with great rapidity, turning out a perfect shoe. This invention will no doubt tend still more to supersede hand labor by machinery, in this branch of art.

WE have received the full report of Commissioner Holt's decision in the Extension Case of Goodyear's India Rubber Patent. It is an interesting document and we shall present copious extracts from it next week.

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# New Inventions.

### Preparing Hair for Stuffing Beds and Cushions.

A patent has recently been issued in England to J. P. Booth, for an improved method of treating short tan-yard hair, or hide hair, by purifying, stiffening, and dyeing the same, and thereby rendering it applicable as an elastic stuffing, whether alone or in combination with other materials, for mattresses and other articles. To purify the hair it is boiled in a solution composed of soda of commerce, quicklime, and water. But before applying the purifying process, and for the purpose of imparting stiffness to the hair, and also of adding to its bulk, the hair is immersed in a glutinous solution, produced by boiling down "fleshing" in water, or dissolving glue therein. The hair is thus caused to absorb a portion of gluten, which will add considerably to its elastic quality. The desired color is imparted thereto in the usual manner of dyeing. When thus prepared, the short tan-yard hair, or what is known in the trade as "pig hair," mixed with the tail and mane hair of horses, or the tail hair of cows, may be applied with advantage to the stuffing of cushions, seats, and other articles, according to the quality of stuffing desired to be produced.

### Manufacture of Velvets.

R. Shiers, Jr., has obtained a patent in England for the manufacture of silk velvets after the manner of those which are now manufactured of cotton, by employing silk threads for the warp and weft, so combined, adapted, and attached to each other as to gain the required surface heretofore produced by forming loops with the warp.

### A New Material for Paper.

Among the patents recently issued in England is one obtained by D. Lichtenstadt for making pulp for paper and other fabrics from leather, or any kind of animal fibrine, whether in large or small pieces, shavings, or shreds, either tanned or untanned. When in the tanned state, in order to extract the tannin, he treats it with caustic lime, or limy matter mixed with sal ammoniac, ammonia, or ammoniacal compounds, and afterwards washes it successively in an acid liquid and water to remove the caustic liquor, when it is pressed and dried, and converted into pulp in the usual way. In case the animal fibrine is not tanned it is first cleaned by being mixed for about two hours in a composition of water, caustic lime, and potash, then washed in cold water, and mixed with gypsum, or alumina, when it is ready for the pulping engine.

### Improved Vice-Anvil.

When T-rails are repaired by welding a new piece on to a rail already worn, or by hammering a rail that has become bent, back to its proper shape, it is necessary, to preserve the shape of the rail, that an anvil be made on purpose, of the proper form; and it has hitherto been difficult to hold T-rails in a vise without injuring their shape when at red or welding heat. The invention which we are about to describe provides this desideratum, as will be seen by reference to the accompanying engravings.

Fig. 1 is a perspective view of the whole apparatus, A being a bed plate, on which is secured the block, B, by means of the mortises and tenons, *a*. Across this block are depressions, *b* and *c′ c′*, which fit the rail in various positions, so that it can be worked upon with as much facility as if it were a square piece on a flat bed. In the bed, A, are two semi-circular depressions, in which rest the semi-circular projections, *e*, of the lever jaw, C, and serve as a hinge on which it can be moved by the foot lever, F. This lever jaw has a rounded edge, *d*, at its upper end, which fits into and firmly grasps the central depression of the rail; it has also a semi-circular projection, *e′*, on which a corresponding depression, *f*, of the locking jaw, D, moves as on a hinge. These jaws are kept in the proper position by a flange, *k*, on the bed, A. The locking jaw, D, has an edge, *d′*, corresponding to *d*, and the rail is firmly held between them, so that any blow or pressure on the rail while between them renders it firmer and more rigid, and has no tendency to produce a recoil. The piece D has an elongation, *g*, which presses against a raised piece, *h*, of the bed, A, and should they not meet, shoe pieces, *l*, can be placed between them, to render the meeting rigid. The locking jaw, D,

## MASON & DAVIS' VISE-ANVIL.

*Fig. 1*

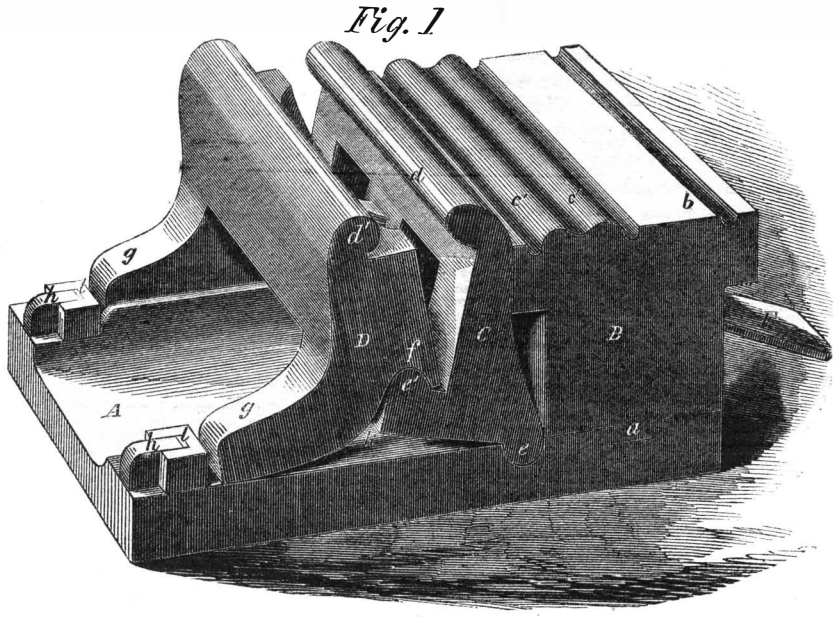



*Fig. 2*

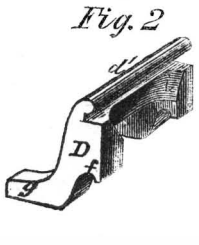



*Fig. 3*

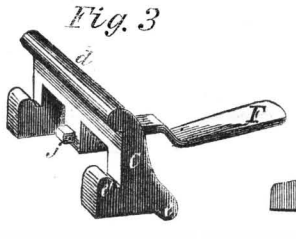
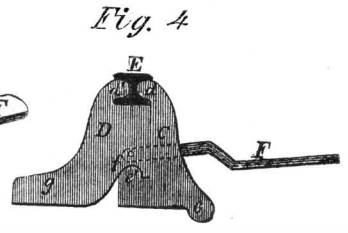


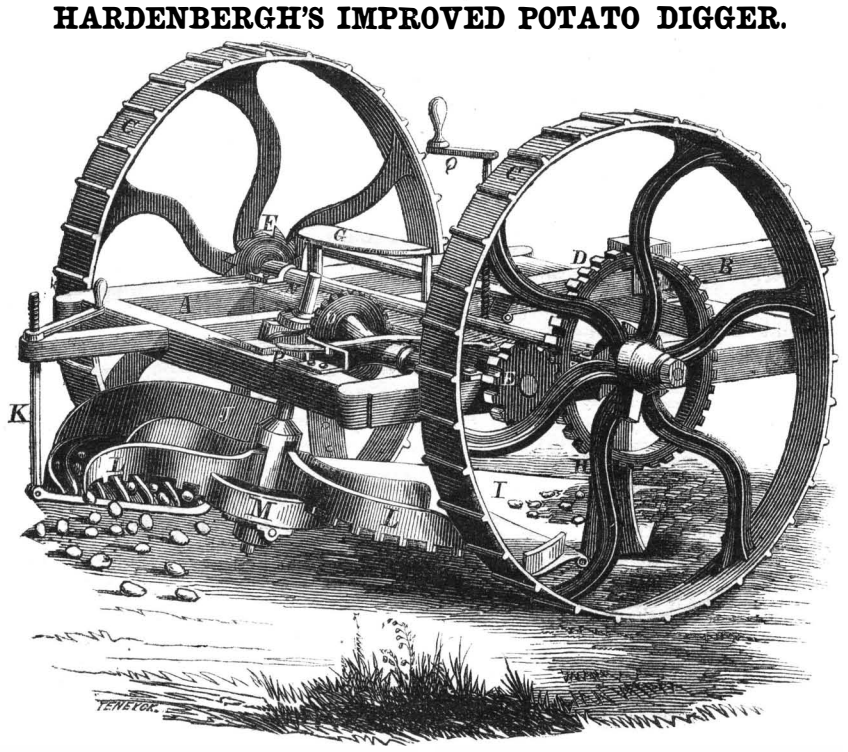

*Fig. 4*




is hollowed out at *i*, to admit of scales, chippings, and sparks passing through, and it does not at all detract from the strength of the vise. The lever, F, is hinged to the jaw by a pin *j*, seen in Fig. 2 and 3, which are views of the jaws detached, and Fig. 4 is an end view of them closed, grasping a rail.

The inventors and patentees are Sanford Mason and Edward Davis, of Michigan City, Ind., from whom any further particulars can be obtained. The device was patented April 6th, 1858.

## HARDENBERGH'S IMPROVED POTATO DIGGER.




The subject of the accompanying engraving will prove a very valuable labor-saving machine, from the great quantity of potatoes it will dig, in comparison with the number raised by the same amount of hand labor. The operation of the machine will be understood from the following description, reference being had to the illustration. A is a strong frame which is drawn by the shaft B, and is supported on the wheels C. Inside of one of these wheels is a geared wheel, D, and on the axle of the wheels are ratchets and pawls, F, so arranged that the gear wheels shall only be rotated when the machine moves forward, and remain at rest when the machine is backed or is turning at the end of a row. From the frame, A, is suspended by means of supports, H, a broad digger or spade, I, and these supports being connected with a cross bar at the top, this digger can be raised or lowered to pass the requisite depth into the ground, under the potatoes, by means of a screw and crank, Q, and the platform and adjuncts immediately to be described can be made to enter the ground at any angle by the screw rod, K, the digger being suspended from H by a hinge or axle. G is the driver's seat.

A small gear wheel, E, works from D, a bevel wheel, O, placed on the end of its shaft, and both these can be disconnected so as to not to receive any motion from D, by the lever P. The bevel wheel O rotates the shaft N, by another bevel wheel, and this shaft has on its lower end four arms, L, which scrape the potatoes from the dirt as they are dug up by I, and clean them by bringing them through the grooves in the platform J. The bearing of N is protected by a rim, M, so that no dirt can enter and interfere with its free working, and to which the bearing is hinged that it may conform to the inequalities of the ground, and the angle at which the platform is placed.

It is a simple and perfect machine and is the invention of J. E. Hardenbergh, of Fultonville N. Y., from whom any more desired information concerning rights (which are for sale) or other particulars can be obtained. It was patented Dec. 22, 1857.

### Eruption of Vesuvius.

The lovely scenery of the Bay of Naples is again made awfully grand and dangerously sublime, by the streams of lava which are descending the sides of this volcano. For the last two years, Vesuvius has been unusually quiet, and has nearly made the world forget the frightful devastations which old eruptions have made, and Neapolitan lazzaroni and Hermitage guides were almost dying of *ennui*, because their expected stimulant would not vomit forth his clouds of ashes and streams of fire. In May last, there were many indications of a coming eruption, and at the close of last month, it fairly set in. From the crater formed by the eruption of 1794, which is two miles in circumference, clouds of smoke began to issue, and then through the cracks in its sides small streams of melted lava were seen to glide. Gradually, but surely, these have increased in volume, covering the mountain's flank with broadening sheets of melted mineral, crackling as it cools. These streams have now covered many vineyards, and surrounded many houses. Palmieri, the Director of the Observatory, has fled, and all the instruments are removed, as the building was threatened with destruction every minute, and we suppose has long ere this been destroyed. Thousands of persons were congregated on the spot within a short distance of the danger, and feasting, revelling and merry-making were going on where, ere now, the scenes of Herculanæum and Pompeii may have been again enacted. The people seemed to be perfectly indifferent, and were plucking grapes with great unconcern while their neighbors were fleeing for their lives, and the only sensation which appeared to be awakened among the non-sufferers was that produced by the grandeur of the scene. Vesuvius is very capricious, and this eruption may stop suddenly or may decimate the locality, but up to the last accounts (June 5th) it was increasing in intensity.

The first and most dreadful demonstration of this natural forge was in the year 79 A. D., when Pompeii and Herculanæum were destroyed, and more than a quarter of a million of human beings were overwhelmed in the resistless flood. In 1631, the town of Torre del Grecco with four thousand people was destroyed, and in 1759, 1767, and 1794 terrible eruptions occurred, being the thirty-fifth time since Pompeii was destroyed, and the second destruction of Torre del Grecco. Since that period, there have been no severe manifestations, with the exception of one of short duration in 1855, and it was hoped, from the gradual decrease of the eruptions that the volcanic action of Vesuvius would cease, and the surrounding country be securely habitable, but such hopes seem now to be vanishing away.

EXPLANATION.—Two articles that appear in this number, namely "Superiority of American Photographs" and "Hints for Keeping Cool," were published in a few of the first issues of our last week's number. When we heard of the proposition of the Health Officer to open the U. S. frigate *Susquehanna* at this season, and thus expose our inhabitants to the yellow fever, we felt it our duty as a matter of local importance to protest against it; and we therefore thought proper to stop the press, take out the articles above named, and make room for some remarks upon this proposed outrage on our community.

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Scientific American.

NEW YORK, JULY 3, 1858.

### The Fate of the Patent Bill.

Congress has adjourned. Many days of the session have been spent in unprofitable discussion, sometimes involving bitter, disgraceful, personal reflection and aspersion. Many speeches have been made for the ear of the constituent, of no practical moment to the national weal; and we fear that many bills have passed that may be denominated "useless legislation," while many really important measures have utterly failed, because compelled to stand on their own merits, with no aid from the lobby to lubricate their passage.

In reference to the all-important subject that most concerns the interests of inventors, viz., amendments to the patent law, we are compelled to reiterate the same old story—nothing done. European inventors, who seem so unsophisticated in reference to the doings of an American Congress, and apparently think that the mere reporting of a bill is a certain sign of its passage, will regret to hear that the much-desired result, so long hoped-for, so confidently anticipated, and so urgently pressed during the session, has been blown to the winds.

An English inventor, because he happens to have been born within the domains of Her Most Gracious Majesty Queen Victoria, must, upon presenting his application for a patent in this country, still continue to pay the outrageous sum of $500. The Frenchman, born just across the English Channel, with no more legal merit, but only because he happens to be a Frenchman, has only to pay $300 for the same privilege. In fact, the children of our venerable friend "Bull" are the only ones who are thus singled out and made to pay the enormous patent fee of $500. Year after year we have uttered our protest against this unjust discrimination, and session after session the Patent Committees have made a most feeble and ineffectual attempt to secure a just and honorable reduction. There has been no opposition to this change—not a single American journal—not a single American inventor—not a single interest of any kind, so far as we can learn, has interposed the slightest barrier to its success; and yet it has failed again, while the public have been made to pay for a mass of legislation scarcely fit to be recorded on the pure parchment upon which it is engrossed.

We speak now in no partisan spirit. We have heard members of all political parties assert that our legislation, as a general thing, whether State or national, has of late years been characterized by wrangling disputes, or been wasted in scheming through measures of a selfish and corrupt nature. Among those useful departments of the government which have been almost wholly neglected by Congress, for many years past, is the Patent Office; and our legislation seems to have become so corrupt that all honest attempts, however few and far between, seem instantly to arouse a great deal of suspicion. An honorable citizen who appears at Washington to enlighten our public functionaries upon defects noticeable in some one of our departments, is instantly set upon as a "free wool" customer, and is branded accordingly. Attempts were made, near to the close of the session, by Senators Simmons and Yulee, both members of the Committee on Patents, to engraft on the general appropriation bills certain salutary resolutions in regard to the fees of the Patent Office, and for paying the salaries of the Examiners, none of which propositions prevailed. One day Senator Yulee tries to get an amendment passed, and Senator Simmons opposes. In a day or two afterwards, Simmons tries to get *his* amendment passed, and fails. We cannot learn from the *Congressional Globe* whether Yulee opposed Simmons or not; but the whole matter, including the discussion which it elicited, seems to have been about as irregular as the racing of a yoke of steers. Senator Hale, of New Hampshire, representing more immediately than many other Senators an ingenious constituency, came forward in the discussion as an antagonist of the general bill reported by the Committee on Patents, and remarked that "from the imperfect knowledge I had of the matter, I thought I saw in that bill some things that were crude and imperfect, and I notified the Committee on Patents that, when it was called up, I should be prepared to say something in opposition to the measure." Now with all proper deference to the wit and wisdom of the Senator, we are curious to know what he thought he saw in his imperfect examination of the bill, to warrant him in announcing his settled hostility to its passage. What "spectre in white" could have flitted across his vision, and so disturbed his judgment in respect to a measure that had met not only the sanction of the Commissioner of Patents, but also the *unanimous approval* of the Committees in both houses of Congress?

Senator Hale, in some remarks made a few days later, takes us somewhat behind the scenes, and intimates his opinions that "political considerations have influenced the appointment and turning out of Commissioners, and the appointment of Examiners, confessedly without the qualifications necessary to the office." Now from an extensive experience of twelve years' practice in the business of the Patent Office, we are prepared to say that Mr. Hale is mistaken. We are of the opinion, and we reach it independent of the clamor of politicians, or the lachrymose cry of some dissatisfied ex-official, that the qualifications of the present examining corps, as a body, are quite equal to those possessed by any previous members of that body, and furthermore, that the present corps of Examiners are much superior in the exercise of proper discrimination and liberal judgment towards the claims of inventors. It is our deliberate conviction, without intending to impute moral delinquency to any one, that the removals which have occurred in the Patent Office during the past two or three years have been useful; and that if those old Examiners had been retained, the revenue of the Office would have been much less than it now is. Inventors had become discouraged, and felt that their claims were most unjustly disposed of. Senator Hale, before he fully launches out in his meditated assault upon the Patent Office, will have to take soundings with great care, or else he may be like one "running a muck with a windmill." The patent bill reported at the last session is not a perfect one, but it is the nearest approach to perfection that we have ever met with in the history of Congressional tinkering on the patent laws, for about twenty years past. We venture to assert that the inventors of New Hampshire, and indeed, all those of the whole country, will heartily approve of the action of Congress whenever it shall pass this plausible bill.

### The Patent Office Structure.

"One of the most beautiful, substantial and appropriate structures in the world is the Patent Office, as it is called, in this city. We do not like its designation, which belittles the building and deceives every man who reads of it. The Patent Office! of course it is some public building, suitable for the deposit of models and the record of great and little inventions. Suppose we call it the Department of the Interior—that greatest of all departments in this great country, which is to be enlarged until its records shall embrace a history of the products, the genius, the skill, the science, the learning, the overshadowing magnitude of the nation.

The Department of the Interior, then, is enclosed in one of the most unique and substantial public edifices in this or any other country. We do not care to speak of its cost; it doubtless cost enough, and too much, unless at some future day it shall be made to cost more by the extension of the space around it. No private individual would ever risk his name and fame upon the construction and grounds of the Department of the Interior. It is constructed like a store on Broadway or Chestnut street, on just ground enough for its foundations. You come upon it suddenly, and look almost heavenward to see the finest building in America. It is cramped in between dwelling houses, stores, stables, groceries, and liquor shops, encouraged a little at a single point, just across the street, by the magnificent Post-office Department.

Is it not possible even to rescue that noble structure from the Vandalism of its surroundings? Is it beyond the line of our economy to clear away the rubbish of two or three of its fronts, and to exhibit the Interior Department as it is to the admiring beholder?"

The above article appears as an editorial in the Washington *Union* of the 23d ult.—the recognized organ of the government. It is got up in a bungling manner, yet its origin sheds upon it a peculiar significance. Had it come from any other source, we should have simply regretted it; but when we discover what seems to be a grave and serious attempt on the part of some one connected with the government, speaking through its organ, to divert one of the noblest institutions of the nation from its original purposes and legitimate design, we feel compelled to utter our protest against it. It is known to our readers that since the organization of the Department of the Interior, under the administration of General Taylor, the Patent Office has been subordinated to it; and true to the spirit "give me an inch and I'll take an ell," a systematic scheme of encroachment has gone on ever since, seemingly intended to rob inventors of that noble building, to the erection of which they have contributed between three and four hundred thousand dollars, and to appropriate it to such uses as were never contemplated by its founders. The Patent Office, the pride of every intelligent citizen, the storehouse and monument of the ingenuity and skill of our countrymen, is threatened with a species of annihilation, which, if suffered to be carried into execution, will wipe out its very existence in name, swallow up its independence, and convert it into an appendage of the Department of the Interior, as a mere tenant-at-will, liable, upon the sudden fancy of some Secretary, to be hustled out of the building, and thus the vast collection of models now generally so well preserved, may be stored away, perchance, in some shed or building wholly unfit for their preservation. Such a state of things is possible, it is even probable; for when we see it seriously announced that "the very designation of Patent Office belittles the building, and deceives every man who reads it," we are prepared to hear the assertion, as applied to the archives and models of the Patent Office, "your room is better than your company;" and upon the *ipse dixit* of some capricious Secretary, whose pride of office and power may be jostled by the too close proximity of a collection of models of "great and little inventions"—to quote from the article in the *Union*—they may be ordered to be turned out to find shelter elsewhere, and thus preserve to himself an agreeable aristocracy of position.

After all that has been thought of the magnificence of the Patent Office, and of its importance to the country, and in the midst of all the great achievements of Art, Science and Industry, the *Union* has come to this lame and impotent conclusion, that it "belittles" a stone building in Washington to call it a "Patent Office," even though its associations are connected with the Cotton Gin, the Steam Engine, the Electric Telegraph, the Reaper, the Planing Machine, and a thousand other useful improvements, without which we could not have made the signal progress which marks our history.

Well, we do not know that we ought to be amazed at this extraordinary proposition. The treatment of men of genius since the world began, has been and still is in accordance with these *belittling* practices. They have been set upon at every turn of their history by a set of men sharper than themselves; they have been laughed at by those who were scarcely fit to brush the dust from their models; and, under what may prove to be a deceptive guise, they have been inveigled by the government out of contributions amounting to between three and four hundred thousand dollars for the purpose of building an edifice as a depository for the sacred preservation of their models and documents, and now it is discovered that it will no longer do to call the building a "Patent Office"—that its distinctive character must be absorbed, because forsooth the title "belittles" it and "deceives every man who reads it."

We are curious to know by what system of reasoning the designation of a building as the "Patent Office" can be termed a deception. Why does not the same charge of deception equally apply to the War, the Navy, or the Treasury Department? Simply, in our judgment, because the universal popularity of the Patent Office and the noble proportions of the structure (designed by the late Wm. P. Elliot, of Washington) diminish that magnitude which might otherwise attach to the Department of the Interior. The United States Government is the trustee of the patent fund; a large part of that fund has been expended on the Patent Office, and the government is sacredly bound to preserve the building from perversion or improper encroachment.

Let the Department of the Interior remain where it is, until a suitable building can be erected for its accomodation; then remove it, and let the Patent Office go on in undisputed possession; for, at the present rate of progress, the whole building will eventually be needed for the transaction of its business.

We believe that the article copied from the *Union* will shock the generous sentiments of the American people. It is wrong in principle and degrading in its tendency. It will meet with no sympathy from the majority of our citizens; while, so far as the great body of inventors is concerned, it will be frowned upon with indignation, as it should be,

### The Susquehanna and our Health Officers.

The dangerous plan which we announced in our last number as having been proposed by Health Officer Thompson, for disinfecting this ship, and sanctioned by the Board of Health, has been carried into effect, and is now being proceeded with at official speed.

In fairness we are also bound to say that we have not, as yet, seen that any disastrous consequences have followed this rash step, but the infection is not compelled to develop itself immediately, and most likely in packing away infected stores our wooden-headed Board is hatching a little nest-egg of epidemic for some future time. The sapiency which dictated a sanction of the removal of infected stores when the thermometer is dancing between 75 and 90°, is, we are happy to say, in some measure accounted for by the fact that the Board of Health of this city is composed of gentlemen who have not the slightest pretensions to medical or scientific knowledge but are placed in that responsible situation without any regard as to qualification, but as a reward for political services. Indeed we should not be surprised if the persons who have this city's physical welfare in their custody, knew just about as much of science as the student who defined Oxygen as *pure gin*, and Hydrogen as *gin and water*. Surely this state of things must be remedied, and we think little of that politician who would allow any motives save a desire to secure efficiency, to guide him in the appointment of a Board of Health.

### Life Boats.

Congress appropriated, during the session which has just closed, $6,440 for the purchase of the best self-righting life boat, for each of the stations on the coast of New Jersey; and $10,000 for the purchase of the life boats (to be approved by the Treasury Department) for the coast of Long Island.

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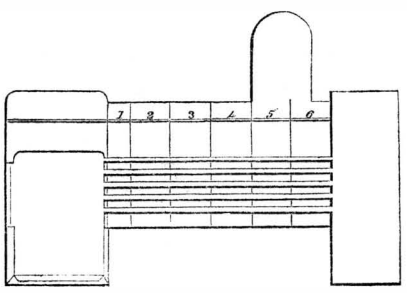
### Steam Boilers and Furnaces.

ARTICLE 2.

Shorter cylinder boilers than most of those in common use will probably yet be employed. No man has devoted more attention to this question than C. Wye Williams, of Liverpool, England, the author of an excellent work on furnace and fuel, and the inventor of several improvements in boilers and furnaces. He has lately, through the columns of the London *Engineer*, published some very useful information regarding the evaporative effects of flue surfaces. A very general notion used to prevail in regard to the economy of long flues in tubular and cylinder boilers. It was held that the heat of combustion in passing through long flues or tubes gave out nearly all the caloric to the water, and thereby economized fuel. This notion is based upon the supposition that in short boilers the heat rapidly escapes, without being absorbed by the heating surfaces. Plausible as this idea is when first presented, it is easy, however, to perceive that a boiler may be made so long as to be incapable of generating steam for useful purposes. The concentrated heat generated at the furnace end of a long boiler may be carried off at a low temperature by a great mass of water, and thus becoming diffused, may be radiated from a great extent of surface, and fail to generate steam. Some have held that mere tube surface is equivalent to evaporative power, and nine square feet of such surface to one square foot of grate has been called "a horse power." Upon such ideas, many boilers, with very long tubes, and others with longer flues, have been made in the expectation that evaporative effects would be obtained in proportion to the extent of long flue and tube surface. Recent experiments have demonstrated the inaccuracy of such notions. It has been found that heating surface rapidly diminishes in useful effect, as it recedes from the fire.

The following figure is a longitudinal section of an experimental tubular boiler with which several experiments were made by John Dewrance, engineer of the Liverpool and Manchester Railway, England. This boiler was




divided into six water compartments, in order to ascertain the weight of water evaporated in each. The first chamber was but six inches long, each of the others twelve inches. The tubes were five feet and a half long, and run from the fire to the smoke-box in the usual way. In the first compartment, each square foot of the heat absorbing surface was found to evaporate as much water as each square foot of the fire-box surface. In compartment 2, each square foot of heating surface was only about one-third as efficient as a like amount of surface in No. 1 in the remaining four compartments, the evaporation was so feeble, that Mr. Dewrance said, "I came to the conclusion that the first six inches of the tubular series had more evaporative effect than the remaining sixty inches."

Similar experiments have also been made by C. Wye Williams, the results of which have been published in the London *Engineer*. He employed a small cylindrical boiler divided first into five compartments, with a tubular three-inch flue running through the interior to the chimney. The first chamber near the fire was six inches long, the other four were twelve inches. A thermometer was placed in each compartment, and one in the neck of the chimney, to indicate the temperature of the water in each chamber, and that of the escaping products of combustion. In an experiment of four hours' duration, 6 pounds of water were evaporated in the first compartment of six inches, 2 pounds 9 ounces in the second, 1½ pounds in the third, 1 pound 3 ounces in the fourth, and 1 pound in the last. The small chamber nearest the fire evaporated five times more water than the one of double the size, at a distance of four feet further from the fire. The heat of the escaping products of combustion in the chimney was about 500 Fah. Another experiment was tried with the same boiler lengthened half a foot in order to make the water chamber nearest the fire of equal size with the other four. In an experiment of three hours' duration, 7 pounds 5 ounces of water were evaporated in the first compartment; in the last, near the chimney, 3 pounds 15 ounces. This gives a far greater useful effect, for the water chamber farthest from the fire than in the first experiment. In the first, the compartment nearest the fire was ten times more efficient, in the second, not quite double. What was the reason of this? It is stated that in the second experiment the heat of the escaping products of combustion was 800° Fah., or 300° higher than in the first experiment. It therefore appears, from these results, that in order to obtain anything like a useful effect from the heating surfaces of long boilers, that the products of combustion must escape at a very high temperature. "These experiments," says Mr. Williams, "dispel the illusion that mere tubular surface has the heat absorbing power usually attributed to it." Mr. Zerah Colburn and Mr. Thomas Prosser have, in the *American Railway Times*, replied to Mr. Williams in reference to the efficiency of tubular boilers. To us it appears that the experiments referred to were only held by the author of them to demonstrate that mere *heating surface*, as commonly understood, is also improperly understood in regard to its evaporative efficiency. Thus, for example, one square foot of grate area, and nine square feet of heating surface is held to be equal to a horse power. Regarding the amount of heating surface (that of a flue or tube in a boiler) allowed for a horse power, there are a variety of opinions. Some hold that only one-third of the tube surface should be called effective; others one-half (the upper), while others consider that the whole surface surrounded by water, or *vice versa*, should be calculated as efficient. Allowing any of these views to be held as a standard, the experiments referred to prove how incorrect such a standard is. The heating surface in boilers is efficient according to its proximity to the fire; its efficiency decreases as it recedes from the fire, therefore it is not so much the amount as the position of the heating surfaces which should be considered efficient.

### Horseshoeing.

There are unfortunately few of the persons engaged in the skillful art of horseshoeing possessed of a full knowledge of the delicate organization of the feet of horses, and their susceptibility to injury by improper paring of the hoof, formation of the shoes, and attachment of the same. Horses are peculiarly sensitive to lameness, and it is obvious that great care in the particulars mentioned should be observed in order that a firm, positive and comfortable tread should be given the feet, so as to make them capable of exerting the wonderful degree of muscular strength of which they are possessed without injury to the exquisitely constructed parts which are brought into play. In the June number of the Dublin *Agricultural Review*, we find a long article written by William Miles, extracted from the Journal of the Royal Agricultural Society of London, and as it is impossible from its length to insert it entire in one number of our paper, we have concluded to divide and publish it in detached portions. We heartily commend this able production to the perusal of those of our readers interested in this important subject. The first portion commences as follows:—

If I were asked to account for my horses' legs and feet being in better order than those of my neighbors, I should attribute it to the four following circumstances: First, that they are all shod with few nails, so placed in the shoe as to permit the foot to expand every time they move; secondly, that they all live in boxes instead of stalls, and can move whenever they please; thirdly, that they have two hours' daily walking exercise when they are not at work; and fourthly, that I have not a head-stall or rack chain in my stable. These four circumstances comprehend the whole mystery of keeping horses' legs fine, and their feet in sound working condition up to a good old age.

All that is really required is to take one anatomical and one physiological fact on trust, and believe that the horse's hoof is lined by a very sensitive membrane, which must on no account ever be wounded, and that the hoof itself is elastic, and expands when the weight of the horse is thrown on the foot, and contracts when it is taken off again; all the rest is purely mechanical, and merely calls for the exercise of a little thought and patience to understand the principle and apply it.

The result of the numberless experiments I have made at various times, on all sorts of horses doing every kind of work, is, that there is but one principle to be observed in horse-shoeing, which will admit of no variation or compromise; the shoe must fit the foot, whatever the shape of the foot may happen to be, and it must be nailed to the hoof in such a manner as will permit the foot to expand to the weight of the horse; this latter condition will be best complied with by placing three nails in the outer limb of the shoe, and two in the inner limb between the toe and the commencement of the inner quarter; a larger number than five nails can never be required in any shoe of any size, or under any circumstances, excepting for the sole purpose of counteracting defective and clumsy fitting.

No horse should have more than one foot bared at a time; however strong his feet may happen to be, he is sure to stand quieter on a shod foot than he can on a bare one, and it will prevent his breaking the crust. A horse with weak flat feet is in positive misery when forced to sustain his whole weight on a bare foot, while the opposite foot is held up.

A strong foot with an arched sole, when the roads are in good order, will require to have the toe shortened. the quarters and heels lowered, and the sole pared, until it will yield in some slight degree to very hard pressure from the thumb; but on no account should it ever be pared thin enough to yield to moderate pressure; the angles formed by the crust, and the bars at the heels, must be cleared out, and all the dead horn removed therefrom, and the bars should be lowered nearly to a level with the sole.

A weak flat foot, on the contrary, will bear no shortening of the toe, and very little paring or lowering anywhere; the heels of such feet are sure to be too low already, and the sole too thin; in fact, the less that is done to them the better beyond clearing out the dead horn from the angles at the heels, and making the crust bear evenly on the shoe; but the hollow between the bars and the frog, or the frog itself, must never be touched by a knife in any foot, whether it be a weak one or a strong one, and as these latter directions differ materially from the usual practice of smiths, I may, perhaps, be expected to state my reasons for wishing to enforce them in opposition to what they no doubt consider a time-honored custom; I mean, the inveterate habit they all have of trimming the frog, and opening out the heels at every shoeing; but I think I shall be able to show, that "it is a custom more honored in the breach than in the observance."

The shoe should be neither too light, nor too narrow in the web; light shoes are apt to bend before they are half-worn out, and narrow-webbed shoes expose the sole and frog to unnecessary injury from stones in the road. Every fore-shoe should be more or less seated on the foot-surface, to prevent it pressing on and bruising the sole; but a perfectly flat surface should be preserved around the edge of the foot-surface of the shoe from heel to heel for the crust to rest upon. The amount of seating to be employed must be determined by the description of foot to be shod; for instance, a broad foot, with a flat sole and weak horn, will require a wide web, considerably seated, to prevent it coming in contact with the sole and bruising it; but a narrow foot, with an arched sole and strong horn, will require less width of web and less seating, otherwise the dirt and grit of the road would become impacted between the shoe and the sole, and cause as much pressure and injury as the iron would have done.

### Superiority of American Photographs.

It is a well-known fact that the photographs produced in this country are superior, both in point of distinctness in the more minute features and details, and softness and general excellence in the lights and shades, than those executed in Great Britain and the manufacturing cities of Europe. This marked difference has been attributed to various causes by those who have written upon the subject; and as the photographic artists of America use the same chemicals and materials in the preparation of the plates and paper, and the same description of instruments and lenses for concentrating the rays of light, as those employed by foreign artists, they generally agree that this superiority must arise from a more skillful manipulation of the plates on the part of the American artist, and in the employment of the light, or a more clear and better adapted atmosphere for the purpose. The Scottish Photographic Association had the subject before them at a late sitting, and one of its members asserted that the perfection of a photograph depended, in a great measure, upon the calmness of the air through which the necessary rays of light passed, and that the air of Great Britain and the manufacturing cities in Europe was in a more disturbed state, from local causes, than in America, and hence the superiority of American photographs. He stated that it was not on account of the brightness of the sun and drier character of the atmosphere claimed for America that the marked difference was owing, for early in the morning he was enabled to obtain as beautiful and distinct pictures as could be produced in any country; but when the factories and the busy life of the city sent up thousands of columns of smoke and heated air, it caused such a vibration of the atmosphere as affected the rays of light passing through it, and on this account blurred and indistinct pictures were produced.

### Hints for Keeping Cool.

To preserve the system in a cool and healthy state during the extreme hot weather of summer, the diet should consist as much as possible of fruits, vegetables, and farinaceous food, and the lighter kinds of meats. The fruit should be perfectly ripe and fresh from its parent stem, and should be eaten in the earlier and middle part of the day. Its nutritive properties are not very great, but it serves to neutralize the acids in the stomach, and acts as a general corrective to the system. In the warmer climates of South America, Spain, and Italy, where fruit abounds, the inhabitants freely partake of it an hour or two before breakfast, and during the middle of the day, but never after; they holding to the Spanish maxim that fresh and ripe fruit is gold in the morning, silver at noon, and lead at night. The people of the tropical climates perform very little active labor during the extreme heat of the day, but generally remain inactive and under cover, in habitations constructed with a view to coolness. The best mode of keeping buildings cool and free from flies during the "dog days" is to open all the windows and doors for an hour or two before sunrise, so as to fill every accessible portion of the building with the cool fresh air of the morning, and then to close them sufficiently to keep out the sun and light. The cold air within will serve as a barrier to the entrance of the heat during the day, and the darkness to the entrance of the flies and other insects.

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## Correspondents

S. N., of N. Y.—Sand is less fusible than iron, therefore it requires a higher temperature to melt it. Sand radiates the heat imparted to it more slowly than iron. It would not answer for lining the inside and outside of stoves. Fire-brick is far superior to it for inside lining, and soapstone for the outside coating. Iron is a good conductor; sand is classed among the non-conductors of heat.

T. M. B., of Pa.—Any work on photography will instruct you how to prepare paper for taking impressions by the camera obscura.

T. C., of Pa.—Air bags or buoys have been attached to the Atlantic telegraph cable, and found not to answer.

C. J. W., of Ill.—H. C. Baird, of Philadelphia, is publisher of a work called the "Practical Distiller," which will give you the information desired regarding domestic liquors.

H. R., of Ky.—The following is a safe and excellent recipe for tooth powder: Fine chalk, 2 ounces, powdered cuttle fish, 2 ounces, and powdered orris root, 1 ounce. Mix all together, and use at night before retiring.

H. P. I., of Conn.—Iron pipe is not only cheaper than lead, but much healthier, especially for conveying water to be used for domestic purposes.

F. K., of La.—Your plan for disinfecting the U. S. frigate Susquehanna by the fumes of sulphur would not be so effective or so simple as the use of chlorine which we have already proposed.

E. & G. D., of Mass.—To "case harden" iron, make up a paste of powdered prussiate of potash and water; coat the iron with this paste, and set it aside to dry. Let the forge fire be clear and bright, and when the paste is dry upon the iron insert the article in the fire until it becomes of a cherry red color. Keep it at this heat for a few minutes, then take it out, plunge it into cold water, and it will be found converted into steel at the surface—case hardened.

W. J. V., of N. Y.—The soda water which is sold in drug stores really contains no soda, but it is a solution of carbonic acid gas in water under pressure. To manufacture it requires costly apparatus. The sirups are the juices of fruit boiled with sugar, to keep them from acidifying. A cheap glass of soda water may be made by dissolving in half a tumbler of water a teaspoonful of bi-carbonate of soda, and then add a spoonful of powdered white sugar; in another half tumbler of water dissolve a spoonful of citric or tartaric acid, pour into the bi-carbonate of soda, and drink while effervescing.

J. E. G., of Pa.—The method that the Chinese adopt in printing water colors from blocks is, to add a small quantity of gum to the color, or else print on very slightly glazed paper. We do not know the method they use in making their water colors. The sample you sent us seems to contain cochineal.

F. M., of N. J.—The best colors you can use for painting magic lantern slides are those called by colormen "dry silica colors," and they should be ground with transparent varnish, not oil, and thinned for use with turpentine.

McM. & H., of Ohio.—We have no records of a common magnet having its lifting power increased by inclosing the weight to be lifted in an iron tube; the principle of action, however, is well-known. Thus in arming magnets their lifting power is increased by gradually adding pieces of iron to the arming weight.

J. C. B., of La.—To give all the information you want in regard to the manufacture of candy, artificial beer, cider and wine, in a practical manner, would require more than a whole column of our paper. We cannot give the explanation you want in regard to the rule.

R. P. B., of N. J.—The frogs and red worms which are oftentimes seen in great numbers covering the surface of the ground, after a shower in summer, generally come out of the ground; they do not fall from the clouds. There are instances on record, however, of showers of fish and worms, which must have been carried from a distance by a whirlwind. A shower of small worms fell on the top of the snow in Virginia, during the winter preceding the last. It was supposed that they were carried by a strong wind from a considerable distance south.

D. L. P., of Mass.—To render paper partially waterproof prepare it as follows:—Make up a weak solution of soap containing a very small quantity of glue, and immerse the paper in it until it is wet through. Now take it out, dip it into a solution of alum, and dry it. The article on making water-proof paper to which you refer, is credited to Professor Muschamp. Protoborate of manganese is not for sale in this city. The common oxyd is used for preparing drying oils; its price is 12 cents per pound. We can furnish Vols. 6, 7 and 12; also back numbers of this Vol. Sci. Am.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, June 26, 1858:—

P. T. B., of Ill., $30; A. S., of Pa, $30; M. J. B., of Tenn., $30; H. L. A., of Wis., $35; A. S., of N. Y., $55; D. C. Jr., of Ala., $25; J. W., of N. Y., $35; C. & N., of Ill., $25; F. C., of N. Y., $10; E. M. S., of N. Y., $30; J. J., of N. Y., $20; A. F. B., of Wis., $30; J. B., of N. Y., $20; L. E. H., of N. Y., $35; E. H. N., of Conn., $47; P. P. T., of Vt., $25; T. R. R., of Ohio, $30; D. B., of N. Y., $25; J. N., of Conn., $25; A. T., of N. J., $10; S. R. B., of N. Y., $25; J. L., of Ind., $30; J. H. R., of Ill., $31; P. D. B., of N. J., $30; S. R. W., of Ill., $25; O. L. C., of Ill., $250; F. J. G., of N. C., $20; W. R. W., of Mass., $30; O. R. B., of N. Y., $45; R. B., of N. Y., $30; W. P., of Mo., $25; E. C., of N. Y., $30; G. W. L., of Tex., $27; E. D., of La., $55; J. J. W., of L. I., $25; T. B. B., of Conn., $10: D. C. R., of Ill., $30; R. L. M., of Ohio, $25; J. P., of Ohio, $30; E. W. K., of Ill., $30; G. C., of N. Y., $55; E. A., of N. Y., $57.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 26, 1858:—

L. E. H., of N. Y.; E. H. N., of Conn.; G. W. L., of Texas; J. H. N., of Iowa; D. B., of N. Y.; B. & P. of Mass.; S. R. W., of Ill.; R. L. M., of Ohio; W. P., of Mo.; D. C. Jr., of Ala.; M. J. B., of Tenn.; M. & B., of Mich.; J. J. W., of L. I.; W. H. Van G., of N. J.; W. R. W., of Mass.; S. R. B., of N. Y.; O. R. B., of N. Y.; H. L. A., of Wis.; C. & N., of Ill.; E. A., of N. Y.

### Literary Notices.

A Poor Fellow. Dick & Fitzgerald, New York. This book is written by some one who is well up in New York literary circles, and it gives some of the *parvenu litterateurs* some very ungentle taps. The story is good, the moral excellent, and the style easy. This book, we think, will be favorably received.

The Atlantic Monthly for July contains some good essays and poems, but we do not think it is equal in interest to other numbers. "The Autocrat of the Breakfast Table" is becoming rather tiresome, and we think that its distinguished author might well employ his pen in some other direction.

Household Words—Published by Jansen & Co., No. 118 Nassau street, New York—This excellent periodical, ever fresh, lively, and sparkling, has many brilliant sketches in this number, which alone render it worthy of an attentive perusal.


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Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office, 128 Fulton street, New York. We have lately established a Branch Agency on the corner of F. and Seventh streets, Washington (opposite the United States Patent Office). This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it.

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Yours, very truly, CHAS. MASON.

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# Science and Art.

### French Pigments.

A correspondent of the London *Mechanics' Magazine* informs that journal that in the arsenal of Brest, and elsewhere in France, a process is extensively adopted, which consists in the employment of certain salts of zinc, together with the oxyd of the same metal, and a substance designated as a *retarding agent*, as a vehicle or medium for pigments. This retarding agent appears to be borax, or the carbonate of soda, one of which substances is added to the zinc salts in solution previously to its being mixed with the oxyd. The salts mentioned are the chloride and sulphate of zinc. The proportion of the "retarding agent" is not well ascertained, but the proportion of the salt to the oxyd is that of their chemical equivalents. Although at first sight these facts seem to be, chemically, absurd, yet it is confidently asserted that this compound affords a paint as permanent as oil paint, at a fraction of its cost. This is a valuable discovery; and if we can procure, by the unison of chemical substances, colors that will stand the weather without the medium of oil or varnish, it will be a great contribution to our accumulation of facts.

### Cremation.

Messrs. Editors.—Being pleased to find in your valuable journal of the 19th ult. an article upon "Burning of the Dead," based upon the criticism of the New York *Evening Post*, upon a late work of an English author, I beg to suggest that you favor your readers with a fuller consideration of the subject, and if convenient, with a brief historic account of the practice.

I like the somewhat poetical, but practical, and very useful ideas of the English surgeon, but would make one addition to his proposition, to make it accord with the old Roman and Grecian custom, that is, after the body shall have been burned, the ashes shall be gathered into an urn, and treasured among one's "household gods," thus placing within our own care, relics that we are now accustomed to consign to the custody of others. I would gladly see an opening wedge driven into that bugbear "popular prejudice," and the people induced to give the matter a fair hearing, feeling assured that this is all that is needed to make the idea of burial, at some future time, as revolting as cremation now seems to be.

Agreeing with you that cremation is necessary as a sanitary measure, I would cite the case of the Paris Academy of Medicine, which has again set the papers to writing, and the people to thinking earnestly, of the revival of this practice. They say that, in the summer time, the Parisian hospitals are crowded by the victims of pestilence engendered by the foul air of the graveyards in the neighborhood. The vicinity of the cemeteries is a constant source of mortality; their putrid emanations filling the air, and the poison they emit impregnating the water; are held chargeable for the many new and fearful diseases of the throat and lungs, which baffle all medical skill. Lamartine gives his adhesion to the project; and it should not be forgotten that Lord Byron and Trelawney reduced to ashes the body of the poet Shelley, and at his own request.

To show that the case which you mention as having occurred some years ago in a western city is not without precedent in our own country, allow me to quote the following:—

"Henry Laurens, of South Carolina, one of the most eminent men of our revolutionary era, the descendant of a French Huguenot family, a member of the first Provincial Congress, an intimate friend of Washington, United States Minister to Holland, a signer of the preliminaries of peace on the 20th of [illegible]ember, 1782, at Paris, in conjunction [illegible]Franklin, Adams, and Jay; dying in Charleston on the 8th of December, 1792, at the age of sixty-nine, concluded his will with the following condition, enjoining the fulfilment of it upon his son, as the terms upon which he should inherit an estate of sixty thousand pounds sterling: "I solemnly enjoin it on my son, as an indispensable duty, that as soon as he conveniently can after my decease, he cause my body to be wrapped in twelve yards of tow-cloth, and burnt until it be entirely consumed; and then, collecting my bones, deposit them wherever he may think proper." And this request was literally complied with.

Considered poetically, sanitarily, and economically, as a strictly national custom, not a religious rite, I believe the crematory view to unite these and other valuable desiderata; and as ignorance and prejudice are easily offended, I trust that there may be soon applied to the subject a common deliberation, not forgetting

Common Sense.

New York, June, 1858.

## DOYLE'S PATENT WINNOWER.

*Fig. 2*

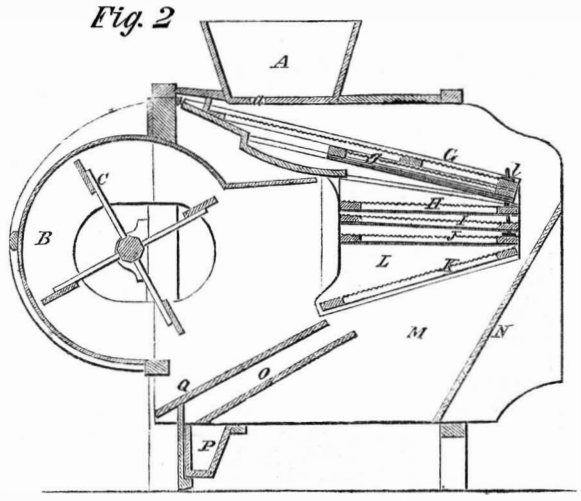
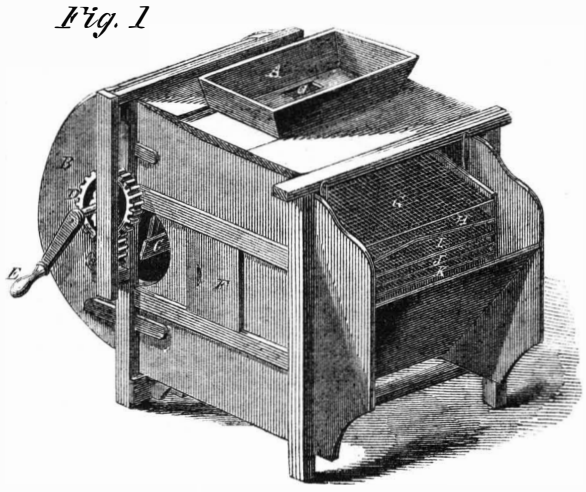



*Fig. 1*




This invention consists in the addition of a fine uppermost riddle, G, long enough to extend back under the hopper of the winnower and back over the double sloping screen, H, and resting on the whiffle tree. The advantages which this winnower possesses are briefly as follows. A finer riddle is used to begin with, there is a more thorough cleaning, and by its size the bouncing and scattering of the grain is prevented, and all the dust, filth, white caps and other matter are kept out of the machine. The grain is quickly and thoroughly cleaned and less large grains get mixed with the tailings than is usually the case.

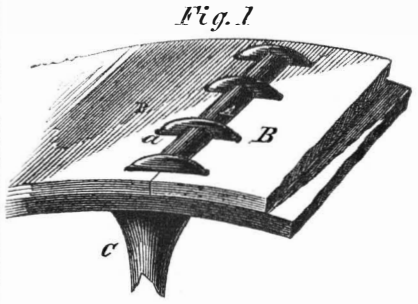
Our engravings fully illustrate the invention, Fig. 1 being a perspective view, and Fig. 2 being a vertical section through the machine. Similar letters indicate the same parts in each. A is the hopper into which the grain to be cleaned is placed and it falls through the small aperture *a*, on the top riddle or screen, G, from that to the next screen, *g*, and then to the double sloping screen, H, which thoroughly and evenly distributes the grain over the remaining screens, I, J, K. These screens are secured at the proper distance apart by a screw rod, *l*, and are of wire webbing of different degrees of fineness; they are mounted in a shoe or shaker, L, which is operated from the axle of the fan in the usual manner. At the side of the box are openings provided with sliding doors, F, through which the cockle can escape when desired. The blast is created in the usual way by means of a fan, C, rotated very rapidly by the gearing, D, and crank handle E. The large grain being less influenced by the draft, falls through the spout, Q, the second quality falls through the spout, O, into the spout, P, by which it is conducted away; the tailings pass through the open space, M, being kept from being blown away by the inclined board, N.

It was originally patented April 20, 1852, and another patent was secured for additional improvements, Dec. 15 1857, by the inventor, Thos. J. Doyle, of Stanton, Va., from whom all further information can be obtained.

### Smith's Patent Belt Coupling.

Good as are the many devices which have been invented, patented, or proposed, for the purpose of attaching and connecting the ends of belts, we are not aware of any that can surpass for cheapness and perfection the one which is the subject of our engraving. Its simplicity can be at once appreciated by reference to the illustration.

*Fig. 1*



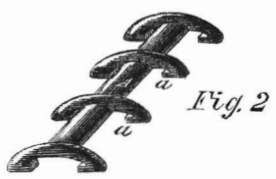




*Fig. 2*

A, Fig. 2, is the coupling; it is of cast iron, and consists of a central bar, provided with arms, *a*, whose ends are bent inwards, so that they will hold or "bite" into anything in which they may be placed. Fig. 1 shows the application. C is the periphery of a band wheel, and B B are the ends of a belt, that have holes punched in them just corresponding with the arms, *a*, of the coupling, which are placed in the holes as shown, and the moment the slightest strain comes upon the belt, the coupling "bites," and the belt is firmly and securely joined. The coupling is flush with the inside of the belt, and so does not obstruct, in the slightest, its motion. We have seen certificates from persons who have had these couplings in use some time, and all say that they answer admirably.

This improvement was invented by Lewis Smith, of Buffalo, N. Y., and patented by him Nov. 17, 1857. Any further information can be obtained by addressing B. W. Miller, Buffalo, N. Y.

### Marking the Corners of Streets.

A correspondent complains of the neglect of the municipal authorities in cities, towns and villages to distinctly mark the names of streets on the edifices erected thereon. We have ourselves suffered much inconvenience from this omission when in strange localities, and we think with our correspondent that the authorities should take the matter in hand, and see that a general and thorough marking of streets' names takes place at *every corner*, and so distinctly and free from such obstructions as awnings, as to enable a person in an omnibus to distinguish them. There are several contiguous blocks in this city where the old houses that had the names of the street on them have given way to magnificent edifices, having every decoration and costly ornament lavished upon their exteriors, but the trifling expenditure for the name of the street has either been thoughtlessly or wilfully neglected. If, as is suggested, there is a law passed compelling every builder who takes down the name of a street to replace it after the new building is erected, and the authorities act as before-mentioned, the difficulty complained of would be at once remedied, and strangers as well as residents, would be saved much unnecessary annoyance and trouble.

### Cure for Burns.

The *Gazette Medicale* of France says that, by an accident, charcoal has been discovered to be a cure for burns. By laying a piece of cold charcoal upon a burn, the pain subsides immediately. By leaving the charcoal on one hour, the wound is healed, as has been demonstrated on several occasions. The remedy is cheap and simple, and certainly deserves a trial.

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